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CIS

REAUTHORIZATION OF THE FEDERAL WATER POLLUTION CONTROL ACT

(101-64)

HEARINGS

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES

OF THE

COMMITTEE ON
PUBLIC WORKS AND TRANSPORTATION
HOUSE OF REPRESENTATIVES

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

MARCH 21, 22; APRIL 4, 1990

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REAUTHORIZATION OF THE FEDERAL WATER POLLUTION CONTROL ACT

WEDNESDAY, MARCH 21, 1990

House of Representatives,
Subcommittee on Water Resources,
Committee on Public Works and Transportation,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:00 a.m., in Room 2253, Rayburn House Office Building, Hon. Henry J. Nowak (chairman) presiding.

Mr. Nowak. The subcommittee will come to order.

This morning the Subcommittee on Water Resources meets to seek testimony concerning the reauthorization of the Federal Water Pollution Control Act. The Act was last reauthorized in 1987 with the enactment of the Water Quality Act of 1987, it was a veto override of the President.

When the Federal Water Pollution Control Act was substantially rewritten in 1972, it established an expanded Federal commitment to the cleaning up of our Nation's waters. Although Congress has had a role in water pollution control as far back as the 1800s, it was the Federal Water Pollution Control Amendments of 1972 which provided the most comprehensive response to water pollution problems to that time.

These amendments established the basic statutory authority under which the program currently operates. The 1972 amendments revised the Federal approach to water pollution control by establishing a national uniform effluent limitation standard to be applied to industrial and municipal sources of pollution rather than basing control requirements on water quality standards and working backwards.

These technology-based standards focused on specific limits on the amount of pollutants rather than solely on the quality of receiving waters. The standards and statutory deadlines were designed to achieve increasingly more stringent pollution control.

The Act set a goal of fishable and swimmable waters by 1983, and the elimination of all pollutant discharges by 1985. As we well know, these goals have not been met.

The Act has been revised several times to further refine the requirements of the Act to achieve even greater levels of pollution control, and to continue financial aid to municipalities for construction of sewage treatment plants for municipal waste.

The most recent amendments, the Water Quality Act of 1987, continued this committee's efforts to achieve the original goals of the Federal Water Pollution Control Act. The 1987 amendments included several legislative initiatives to further improve the nation's waters. Among these was a program for the control of non-point pollution.

The Act requires states to development management plans for the control of non-point pollution into waters which have been adversely impacted by such pollution, and provided grants of $400 million over four years to assist the states in developing and implementing those programs.

Unfortunately, while the states have endeavored to develop such management plans, the federal financial assistance for this program has not materialized. Other notable programs in the 1987 Act included individual control strategies to address toxic hot spots, anti-backsliding provisions to limit increases in pollution discharges, a revised and stiffened system of administrative, civil and criminal penalties, a guideline for the regulatory control of stormwater discharges, a national estuary program, and programs designed specifically for the Great Lakes and Chesapeake Bay.

Finally, one of the more significant policy changes in the 1987 amendments was a phase-out of the construction grants program and its replacement with a new program of grants to states for the capitalization of state revolving loan funds. These loan funds would be available for the states to provide assistance to localities, and with loans being repaid to the states, the money would be available for recycling to future water quality activities providing an ongoing source of funding.

Several of the Water Pollution Control Act's monetary authorizations are expiring at the end of this fiscal year and several others expire at the end of fiscal year 1991. At these hearings, we will explore issues related to the reauthorization of these programs, as well as receive testimony concerning other aspects of the Federal Water Pollution Control Act.

With us today are several members of Congress, representatives of the U.S. Environmental Protection Agency, and representatives of several groups with a keen interest in the Federal Water Pollution Control program.

At tomorrow's hearing, we will continue with additional members and representatives of other organizations with an interest in water pollution control programs. Thursday afternoon we will receive testimony concerning cleanup issues at Onondaga Lake, New York.

Before we begin with our first witness, I yield to my distinguished colleague, Mr. Upton, for any opening remarks he wishes to make.

Mr. **UPTON**. Thank you, Mr. Chairman. I do have an opening statement, but first I would like to yield to the ranking member of the Committee, Mr. Hammerschmidt.

Mr. **HAMMERSCHMIDT**. Thank you very much, Mr. Chairman.

As you have mentioned today, we turn once again to an examination of the Federal Water Pollution Control Act. Perhaps no environmental law has on balance enjoyed the widespread support this Act has. On two different occasions the House has voted unanimously in favor of Clean Water reauthorization. In fact, a Clean

Water reauthorization bill passed both the House and Senate in 1986 without a single dissenting vote.

While I realize there have been some disagreements with the Executive Branch, particularly during the prior Administration, about funding levels for the sewage treatment program, I know that the basic approaches embodied in the Act have brought support on both sides of Pennsylvania Avenue.

Our confidence in this Act is well-placed. It is an environmental law that has achieved tremendous success over the years in reversing the degradation of our rivers, lakes and streams that so alarmed us 20 years ago. Twenty years ago, we had rivers that caught fire because they were so contaminated. One of our Great Lakes and an area off the northeast coastline were essentially dead. Even the Potomac River resembled an open sewer more than a pristine water way.

Today our Nation's water resources have staged an impressive comeback. While we continue to face many pollution problems, some of which are not being addressed adequately, water quality and the ability of our waterways to sustain diversified uses are significantly improved. In my own state, the water quality of the Arkansas River has improved to such an extent that it is being viewed as a source of drinking water for communities along its path.

Much of the success of the Clean Water program is attributable to a balanced approach of tough regulation coupled with the financial and technical assistance needed to make the regulations work. I am very proud of the role this Committee has played in developing this carrot-and-stick approach and the success we have achieved as a result of it.

Today we will have an opportunity to revisit the Act, to get reports on where it is working and where it is not. Hopefully, we will hear recommendations for refinements that may be needed to address new or ongoing problems. I want to thank all of our witnesses for their testimony. In particular, I want to welcome Assistant Administrator Wilcher, who has testified before our Investigations and Oversight Subcommittee, but is appearing for the first time before the Water Resources Subcommittee.

Mr. Chairman, I know there are several provisions in the Act that have been controversial. We need look no further than the recent series of wetland hearings, held by this Subcommittee, to know that there are issues on which there are strong differences. However, I am confident that we can work together as we have in the past to find common sense solutions to the host of problems. In so doing, we will be furthering the objectives of an Act established almost 20 years ago to restore and maintain the chemical, physical and biological integrity of the Nation's water.

I notice several of our distinguished colleagues here are ready to testify. I am looking forward to hearing their testimony.

Thank you, Mr. Chairman.

Mr. **Nowak**. The Chair will recognize Mr. Pallone for a brief opening statement.

TESTIMONY OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. **Pallone**. Thank you, Mr. Chairman.

I will be brief because I do want to hear the witnesses.

I did want to thank you for directing this Committee's attention to reauthorization of the Federal Water Pollution Control Act, and say that the Clean Water Act has made a significant difference in terms of water quality in my Congressional district. Coastal waters off Monmouth and Ocean counties in New Jersey and Deal Lake have benefitted from programs authorized by the Act, and also stringent criteria imposed for disposal of ocean waste under the National Permit Discharge Elimination System have led to stricter controls at the Ciba-Geigy Chemical Plant in Ocean County in my district.

Regretfully, we have not yet succeeded in meeting the goals of the original Act. Our waters are not completely fishable or swimmable, pollutants continue to be discharged into our waterways. I am committed to working with this Committee to ensure that our goals are met through reauthorization of the Act.

I would like to see programs reauthorized for the construction of sewage treatment plants. In the northeast, the coastal states desperately need continued federal assistance in this area. New Jersey in particular is facing drastic spending reductions. We must consider continuing the revolving loan program or converting back to a grant program if we are going to address water pollution in a realistic way at the federal level.

Deal Lake in Monmouth County in my district has received money under the Clean Lakes program. This project is still in its beginning stages and there are other lakes in Ocean and Monmouth counties which also demand federal cooperation.

I have seen the merits of the Clean Lakes program firsthand and strongly support its continuation. The non-point source control program has been a model program around which citizens in municipalities and working groups in various municipalities have formed coalitions in my congressional district. One such example is the Navesink River conference, a group of elected officials and citizens from five different communities who meet monthly to discuss solving our non-point source problem.

I am anxious to hear from EPA and other groups present today to learn their views on the importance of these programs and hope to continue with the Committee and others regarding programs of particular strength and protectiveness under the Clean Water Act.

Thank you, Mr. Chairman.

Mr. **Nowak**. Thank you very much, Congressman Pallone.

Now we will go to Congressman Upton for a brief statement.

TESTIMONY OF HON. FREDERICK S. UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. **Upton**. Thank you, Mr. Chairman. I would like to introduce into the record by unanimous consent Mr. Stangeland's remarks.

Mr. **Nowak**. Without objection.

[The prepared statement of Mr. Stangeland follows:]

STATEMENT OF HONORABLE ARLAN STANGELAND
CLEAN WATER ACT REAUTHORIZATION HEARING
WATER RESOURCES SUBCOMMITTEE
MARCH 21, 1990

THANK YOU, MR. CHAIRMAN. TODAY, THE SUBCOMMITTEE BEGINS THE FIRST STEP IN REAUTHORIZING AND IMPROVING VARIOUS PROGRAMS AND AUTHORITIES UNDER THE CLEAN WATER ACT.

AS YOU KNOW, WE FACE UPCOMING DEADLINES, AS EARLY AS SEPTEMBER 30TH OF THIS YEAR, FOR VARIOUS AUTHORITIES AND PROVISIONS. THESE INCLUDE THE ALLOTMENT FORMULA FOR STATE REVOLVING LOAN FUND SEED GRANTS, RESEARCH AND ADMINISTRATION AUTHORITIES, AND PROGRAMS FOR CLEAN LAKES (SECTION 314), RURAL CLEAN WATER (SECTION 208(j)), AND CHESAPEAKE BAY (SECTION 117).

TODAY'S AND TOMORROW'S HEARINGS SHOULD HELP TO FOCUS ON THESE IMPORTANT PROGRAMS AND ON WAYS TO IMPROVE THEIR EFFECTIVENESS IN LIGHT OF EVER-INCREASING BUDGETARY CONSTRAINTS. GENERALLY, MR. CHAIRMAN, WE MUST LOOK FOR WAYS TO CONTINUE THE PROVEN SUCCESSES OF THE 1972 CLEAN WATER ACT. WE MUST CONTINUE TO STRIVE TOWARDS ITS WIDELY-SUPPORTED BUT UNMET GOAL OF MAKING ALL WATERS FISHABLE AND SWIMMABLE.

AS WITNESSES WILL DESCRIBE, MR. CHAIRMAN, WE ALSO NEED TO LOOK AT SPECIFIC ISSUES ARISING FROM CHANGES MADE BY THE WATER QUALITY ACT OF 1987. OBVIOUSLY, THIS INCLUDES A CLOSE LOOK AT ONE OF THE 1987 ACT'S MOST FAR-REACHING PROVISIONS: THE TRANSITION FROM CONSTRUCTION GRANTS TO STATE REVOLVING LOAN FUNDS. APPARENTLY, STATES ARE EXPERIENCING A LOT OF ADMINISTRATIVE AND FUNDING PROBLEMS.

WE WILL ALSO NEED TO EXPLORE SERIOUS PROBLEMS WITH PROPOSED COMBINED SEWER OVERFLOW AND STORMWATER PERMITTING PROGRAMS. THESE TWO AREAS ARE PARTICULARLY GOOD EXAMPLES OF WHAT IS BECOMING A CENTRAL THEME: COMPREHENSIVE NEW PROGRAMS AND REQUIREMENTS PLACED UPON MUNICIPALITIES AND THE REGULATED COMMUNITY TO MEET GROWING ENVIRONMENTAL PROBLEMS BUT WITHOUT ADEQUATE FUNDING OR ADMINISTRATIVE RESOURCES. THESE AREAS, AS WELL AS OTHERS SUCH AS NONPOINT SOURCE POLLUTION AND CONTAMINATED SEDIMENT HOTSPOTS, WILL REQUIRE SERIOUS AND INNOVATIVE SOLUTIONS.

PERHAPS THESE HEARINGS CAN LAY THE GROUNDWORK FOR IMPROVED METHODS OF PROTECTING WATER QUALITY WHILE RECOGNIZING FISCAL REALITIES AT BOTH THE FEDERAL AND LOCAL LEVELS.

THANK YOU, MR. CHAIRMAN.

Mr. **Upton**. I would also like to commend you for calling this hearing to discuss several issues related to the Clean Water Act. It is appropriate to note that these hearings on reauthorization of several vital clean water programs come during Great Lakes week.

In 1987, one of my first votes after being elected to Congress, I joined my colleagues in supporting reauthorization of the Clean Water Act. I am proud of that vote and of my support for this Act which has helped the states improve the quality of our nation's water resources, especially the Great Lakes.

As co-chairman of the Great Lakes Caucus, I am distressed by a report being release by the Northeast-Midwest Institute today that shows a program-by-program effect of enactment of the Administration's fiscal year 1991 budget request. Of particular concern to me is the negative impact on the construction of wastewater treatment facilities through the state revolving loan fund program.

The Administration proposed $1.6 billion for construction of these facilities, representing an 18 percent reduction from fiscal year 1990 funding levels, and only 66 percent of the amount authorized by the Public Works Committee in the 987 Clean Water Act. This is just one example of a critical program facing seriously decreased effectiveness under the terms of the President's budget.

As a former worker at OMB, I am fully aware of the budget constraints, and the need to restrain spending. But when it comes to the environment, attempts at short-terms savings can be disastrous, and more costly in the long run, as history has shown us. Shortchanging vital programs to continue the cleanup of the Great Lakes not only affects the health and future vitality of Great Lakes residents, it also threatens the fresh water drinking supply of millions.

As we begin hearing today for the reauthorization of the Clean Water Act, we need to remember that the Federal Government issued a clean water mandate to states, but we cannot expect states and localities to comply without holding up our end of the bargain. Lack of financial investment today will result in increased expenditures of dollars tomorrow.

Thank you, Mr. Chairman.

Mr. **Nowak**. Thank you very much. We will now accept the other statements for the record from any of the other members present, or whoever requests submission.

[Mr. Clement's prepared statement follows:]

STATEMENT OF THE HONORABLE BOB CLEMENT
BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES
ON
THE FEDERAL WATER POLLUTION CONTROL ACT
MARCH 21, 1990

MR. CHAIRMAN, I WOULD LIKE TO COMMEND YOU THIS MORNING FOR SCHEDULING THE FIRST OF TWO HEARINGS ON THE REAUTHORIZATION OF THE FEDERAL WATER POLLUTION CONTROL ACT.

SAMUEL COOLRIDGE'S LINE FROM "THE RHYME OF THE ANCIENT MARINER" - "WATER, WATER EVERYWHERE, NOR ANY DROP TO DRINK" - COULD CHARACTERIZE A GROWING NUMBER OF COMMUNITIES, WHERE THE DRINKING WATER HAS BEEN TAINTED BY POLLUTANTS.

AT ISSUE TODAY IS WHAT PROGRESS THE ENVIRONMENTAL PROTECTION AGENCY AND THE STATES ARE MAKING IN IMPLEMENTING THE 1987 AMENDMENTS TO THE CLEAN WATER ACT. THESE AMENDMENTS PLACED SIGNIFICANT RESPONSIBILITIES ON THE ENVIRONMENTAL PROTECTION AGENCY AND THE STATES TO IMPLEMENT NEW AND REVISED CLEAN WATER PROGRAMS UNDER TIGHT DEADLINES SPECIFIED IN THE LAW. WHETHER THESE MANDATED STANDARDS CAN BE MET, AND HOW COSTS WILL BE SHARED AMONG VARIOUS LEVELS OF GOVERNMENT, REMAIN CRITICAL ISSUES TO RESOLVE GIVEN THE DISCREPANCY BETWEEN FUTURE NEEDS AND CURRENT RESOURCE EXPENDITURES.

MR. CHAIRMAN, I LOOK FORWARD TO HEARING FROM OUR DISTINGUISHED LIST OF WITNESSES THIS MORNING ON THIS VITALLY IMPORTANT ISSUE.

Mr. **Nowak**. It is a pleasure to welcome our first witness, our budget chairman in the House, Congressman Leon Panetta, who has expressed great interest in these programs in the past, and who has worked with the Committee to try to achieve some of the goals that everyone up here, both on the majority and minority sides, has mentioned.

It is a pleasure to have you before the committee.

TESTIMONY OF HON. LEON E. PANETTA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. **Panetta**. Mr. Chairman and members of the Subcommittee, thank you.

I appreciate your having hearings on this issue, because it is, as Congressman Hammerschmidt has pointed out, this has been one of the successful tools used in the effort to clean up our environment. The Federal Water Pollution Control Act was really one of the key elements that was adopted that became part of our arsenal in dealing with environmental problems.

It has become a very important part of that arsenal, because it has truly been successful in the efforts to try to clean up rivers, wastewater problems, and also provide assistance in estuary programs. All of that has been vital.

We still face a number of challenges, obviously, and the biggest problem is the need to try to provide sufficient resources behind this program in order to meet these needs. This is a model program that needs resources if it is going to work. We simply cannot stand back and assume that this program is going to work without sufficient funding and sufficient resources.

I am a believer—although we all recognize the limited problems we have with regard to the budget—that this is an investment that is work making in terms of the future. It really does improve our society. It improves the quality of life in this country, which I think is important for the future.

Having said that, let me address one small item I think is particularly important, particularly for those of us that represent coastal communities, and that is the estuary program under the Act. This estuary program is really key, because it provides the mechanism that is absolutely essential to trying to organize the different agencies that are involved when it comes to estuary problems, and in trying to deal with some of the bays we have along the coasts.

These are problems that involve a number of agencies. If you just look at the number of agencies in my district, we have the EPA, we have the State Water Resources Agency, we have the local water districts, we have the local harbor districts that are involved, the fishing interests, we have all of the development interests that have some impact with regard to what happens with our estuary. It is absolutely essential to bring those groups together into some kind of management plan. Otherwise, you are going to kiss off the ability to have protection for these estuaries.

One of those that I am particularly familiar with is in my district, Morro Bay. I think it has a very unique estuary along the west coast. It is a significant wetland system for the California coastline. It is tied in to both saltwater and freshwater wetland. It obviously supports a number of endangered species, and marine mammals, as well as marine life that are associated with that kind of system. It is also an important part of the Pacific Flyway with regard to protecting those birds that are protected under our various treaties.

All of these features make this bay one of importance from a national point of view. It is also a vital economic interest to the community there. It is not only an important breeding and nursing area, it also provides support for a thriving commercial and recreational fishing and industry.

For all of those reasons, it is very important that we try to get Morro Bay designated one of the estuaries that can be supported by the management features under this Act. There are too many managers, too many different agencies involved. They have to sit down and develop a common, comprehensive plan.

The estuary program is absolutely ideally suited for this. I have experienced it in other areas. It has worked very well. It is the kind of program I think can bring different agencies together to try to develop the kind of effective plans that are necessary if we are going to protect these really vital environmental areas for the future.

It is my understanding that in order for new estuaries to be included, the authorization level in the appropriations must be raised, and that the reauthorization bill must include that increased level. In light of the success of this program, and the need for protection of additional estuaries, I would strongly encourage the subcommittee to increase the program's funding to try to accommodate the inclusion of not only Morro Bay, but other estuaries that fit within the program.

It is worthy of inclusion in the program, I think it gives us a chance to try to make this estuary survive and flourish, rather than become challenged by all the growth problems that are now associated with that area.

For that reason, I strongly recommend an increased authorization level for the estuary program, and also recommend strongly the inclusion of Morro Bay as one of those areas to be designated.

Thank you, Mr. Chairman.

Mr. **Nowak**. Thank you very much, Mr. Panetta. You have modeled this program very well, and I can attest to your interest in Morro Bay. You hit the reasons for the success of this estuary program, and when we tried to fashion it originally, it was to get a broad management cohesive look at an estuary.

As you mentioned, you have Fish and Wildlife very prominently involved, and all the other interests, and trying to coordinate those interests has really been the essence of the success where it has worked, bringing all of those to the table. Of course, that's what we are going to try to do in all the other Lake problems we have, and we will be looking forward to working with you on this particular problem.

As you know, the administration has always expressed some reservations as to expenditure in dollars in this area, but this year, because of the focus and the success that we have seen in this program, the budget request is actually $15,180,000. Yet, if we are going to expand it, we have not yet caught up to the ones that were originally included in the program.

We are going to have to look at evening that number, and plan to—if we are even going to touch new projects—we will have to move that number up to a higher level. We look forward to working with you on that.

Mr. Upton, do you have any questions? Or are there other members that would like to ask Mr. Panetta, while you have the opportunity? Let's encourage him as he goes forward with a very important aspect of the budget process to look at these issues.

As you know, we have a great many other requests. If I may, I would like to give you a resume of what comes after your testimony from people in the states and mayors throughout this country, looking not only at the existing programs, to move them up to the authorized levels, but to greatly expand. We have caps in this program, the non-point pollution program.

And you look at the problem of not only moving up to secondary treatment, but you look at other problems, even when states have invested the dollars to go to secondary treatment. The CSO problem now becomes a bigger factor in the total pollution output in a community. Unless we start looking at that program and trying to make some adjustment there, you are not going to get the total impact I think was envisioned with just moving to secondary level treatment.

So we are going to have an awful lot on the menu, especially as states and cities and towns look at their own problems. That is going to reflect back here, and in trying to do something now that adds to the total solution to their local problems. I think the advent of CSOs and that whole massive problem—in terms of dollars of course, you could start in 1972, when we spent about $55 billion in cleaning up our lakes and streams.

We have some estimates just in CSOs which are going to be equal to that figure if we are to make the same type of effort. So we are going to try to explore where we will get the biggest improvement in the outflow in a community and start to work in that area. Otherwise, the tremendous investment we have already made is very likely to show diminishing returns because of the addition of non-point and CSO pollution into the same bodies of water.

We will try to summarize that for you as we move ahead in the next few weeks, and get that to you as a kind of guide as you proceed with your budget process.

Mr. Panetta. Mr. Chairman, I might mention that obviously as we discuss the overall budget priorities, I think there is concern that obviously we have to address the infrastructure issues. I consider this issue a part of our national infrastructure in terms of how we deal with water quality, particularly as it relates to estuaries and our river systems. There is a focus on that in the budget committee.

I was interested that evidently the county officials that came to town yesterday made a recommendation that somehow we ought to renew the revenue sharing program to try to assist local officials. While I sympathize with that, I don't think there is much chance we are going to renew revenue sharing. But I think it is probably a better use of money to use the kind of ongoing programs we have here in the Clean Water Act, which have proven their effectiveness, proven their worth.

I would much rather invest a little more in those programs that to create something new. Those programs in fact need a Federal responsibility, but they have also proven themselves in terms of their worth to the Nation and those communities.

Mr. **Nowak**. And there is a large incentive, and we can always devise that once again, for this kind of state-Federal-city partnership, if you will. It has worked. What we have to determine is the impact of moving forward with those other sources of pollution and what we can afford to invest in those as we go forward. We have not met the goals of the Act, the 1983 goal passed us several years ago. We will be looking forward to looking with you as we make some progress.

Thank you.

Mr. **Panetta**. Thank you, Mr. Chairman.

[The prepared statement of Mr. Panetta appears on page 324.]

Mr. **Nowak**. Our witness is Congressman Norm Dicks, from the State of Washington. I think he also has concerns about a body of water in his area.

Congressman Dicks.

STATEMENT OF HON. NORM DICKS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Mr. **Dicks**. Mr. Chairman, I appreciate the opportunity to be here today before you and the members of the Subcommittee on Water Resources receiving testimony on the reauthorization of the Federal Water Pollution Control Act, enacted in 1972, now known as the Clean Water Act.

I brought you a map, gentleman, of the State of Washington. As you can see, on the western side of the state is Puget Sound. I just want to have you look at it, because it is a very significant body of salt water that goes almost halfway down through our state, through Seattle and Tacoma, almost to Olympia. It is an enormous body of water.

As we prepare to celebrate the 20th anniversary of Earth Day next month, I think it is important to view the profound impact that the Clean Water Act has had on pollution control efforts throughout our Nation. Before seminal events such as Earth Day, and before our awareness was raised about the fragile nature of our Nation's rivers, bays and offshore waters, we engaged in many practices that are now demonstrating effects that threaten the health and safety of many of these bodies of water.

The Federal Water Pollution Control Act Amendments of 1972 and the Clean Water amendments that have been passed since that time have established a comprehensive approach to cleaning up the Nation's waters. They have set a regulatory framework for the implementation of pollution control technologies, and for control of the discharge of industrial and municipal waste discharges. They have set us on a course toward the restoration of many of the Nation's most important bodies of water, including the Great Lakes, Narragansett Bay and the Chesapeake Bay.

I am appearing before this subcommittee once again today to call attention to another threatened body of water, one which provides economic sustenance and cultural distinction to the Pacific Northwest. Puget Sound in Washington State is perhaps our most precious natural resource. It is a largely pristine estuary which serves as the focus of nearly three million of our state's citizens concentrated around its shores. It is a marine environment rich in fisheries resources, it provides an abundant wildlife habitat, and as our superhighway, it represents the source of international commerce that is a central force in our economy.

Beyond the tangible aspects of Puget Sound, I believe there is every bit as much a cultural connection to the waters of Puget Sound for the people of Washington State as there is for the oystermen of Chesapeake Bay. Just as the Sound confers its physical influence on our geography, it influences the very character of the people and the lifestyles of the Pacific Northwest.

Just as the Chesapeake Bay has suffered the impacts of growth and development, the pristine jewel of the Pacific Northwest is threatened even more profoundly by the rapid growth of what is known as one of America's most liveable places to live.

The early symptoms of a grave illness have clearly been evident in Puget Sound for more than two decades, as industrial contaminants, municipal sewage discharge and non-point source pollution have taken their toll on the water quality. Toxic hot spots in almost of our urban bays have been discovered and have been linked to serious diseases in several species of bottomfish.

Bacterial pollution has caused the closure of what used to be very rich shellfish beds. More than half the Sound's original wetlands have been eliminated by shoreline development. And the nearly incalculable non-point source pollution problem is perhaps the most difficult of all to control—the disposal of household chemicals, oil, gasoline and other contaminants carried passively into the water system through streams and sewers.

The prognosis for this illness is not good, with another 600,000 people expected to migrate to the state by the year 2000, bringing with them even greater development-related problems to the Sound's marine development.

As the members of this subcommittee may know, the Pacific Northwest is a region marked by an exceptional awareness of environmental and natural resource protection. Decades before Earth Day in 1970 we were marshalling the forces of civil activism and expending public funds to combat the damaging impacts of population growth on Lake Washington and other important waters.

We have been concerned. We have been working hard on the complex issues involved in a Puget Sound cleanup program. With the assistance of the EPA, the Puget Sound Water Quality Authority has been actively and aggressively pursuing a management plan for Puget Sound which combines basic research and attention to remedial strategies, where possible.

Puget Sound was designated an estuary of national significance in the 1988 Clean Water Act Amendments, and we have received about $1.6 million each year since 1984 in EPA funding as the federal share of the cleanup program through the national estuary program. The State of Washington has gone far beyond the Federal

Government's efforts, establishing a dedicated cigarette tax revenue base for the Puget Sound Water Quality Authority's management plan. Local jurisdictions are also contributing—in some cases substantial amounts.

At this point, the strategy in Puget Sound must move from concept to action.

In the last Congress and again in the 101st Congress, the Washington Congressional Delegation has proposed the establishment of a specific designation within the Clean Water Act through which increased federal support for the cleanup effort can be channeled.

What we are talking about is a separate line-item to establish a timetable and a funding profile for federal support of the cleanup program for our Nation's second largest estuary. This is what we have done for the Chesapeake Bay program, for Narragansett Bay, for the Great Lakes, and for a select few other critically important bodies of water.

I have introduced H.R. 2670, a bill to authorize a $100 million Puget Sound program, and I am asking this subcommittee to consider today the addition of this legislation to its package of amendments to the Clean Water Act or any other appropriate authorizing vehicle in this session of Congress. This funding limit would be established from which we would request annual appropriations over a 10-year period or longer for monitoring, research, and other activities related to improving the water quality of Puget Sound.

An enhanced level of annual funding from the Federal Government can assure that the Puget Sound Water Quality Authority's monitoring program can be accelerated to keep pace with developing pollution trends. In addition, this comprehensive water quality control effort will sustain many other programs related to water quality in Puget Sound, including an annual inventory of shellfish bed contamination, the search for unpermitted discharges into Puget Sound, an inventory of contaminated sediment sites, urban stormwater programs, and wetlands inventories.

With a more aggressive level of funding, we will be able to conduct a more aggressive research program in critical areas. In order to be able to protect marine organisms, in particular, we need to know more about the natural variations and cycles in the living population in the Sound.

Mr. Chairman and members of this Subcommittee, I am urging today your most serious consideration of this request, a request to make the Federal Government a more active participant in the cleanup of one of the nation's most important and most threatened bodies of water.

Specific designation of the Puget Sound cleanup program will allow for more substantial preventive action that will, in the long run, save taxpayer money as well as preserve our state's most important natural resource.

I thank you, and I appreciate the opportunity to testify. As I said earlier, our delegation on a bipartisan basis has co-sponsored the bill I have introduced. We happen to believe that Puget Sound is just as important as the Chesapeake and the Narragansett and the Great Lakes effort, and we think we ought to be in that category, because of the size and significance of Puget Sound in our part of the world.

Thank you.

Mr. NOWAK. Thank you very much, Mr. Congressman, for your interest.

We are glad to receive your suggestions. They make eminent sense, because when you look at an estuary as large as Puget Sound, certainly one bullet is not going to cure all the problems. The Water Quality Authority that has been established I think is a great step in the right direction. It gives us something we can work with from the federal side to coordinate all the management, broad management plans that have to be in place in order to get significant results.

I was wondering if you know, or if you could provide for the Subcommittee, what that cigarette tax has been.

Mr. DICKS. Yes, I will provide that for the Committee. I think it is about $20 million or $40 million biannually—we do a two-year budget out there. So it is a significant amount of money as you can see. We are only getting $1.6 million from the Federal Government, the state is putting up $20 million.

What we really need is just a little more significant—I think if the Federal Government did more, the state might come back and add to what it has already done. This is really the most crucial environmental issue we face in the state. We also have local governments that will contribute. What we are trying to do is develop a plan that deals not only with all the point sources, but this very difficult issue of non-point source pollution.

As you can see, we are surrounded—the Sound is surrounded by the most densely populated areas of our state. We have all the problems of runoff and development. Yet the authority has come up with a comprehensive plan, one that deserves to be supported. We just need a little more help from the Federal Government, and I am sensitive to and appreciate the problems we appreciate with the budget. I am also a member of the Appropriations Committee and realize that there are limits. But we really think this one is important.

Mr. NOWAK. When you look at your whole prospect, and realize that the National Estuary program now is $11 million in the last fiscal year, and you received that $1.6 million, but is dwarfed, really, by the states own efforts and the local efforts on top of that.

I would think that we have to come to the realization that if we are going to make an impact, Federally, we are going to have to expand not only the estuary program, but also provide some broadened kind of support, especially if the states are willing and able to cooperate. In your instance, you have a dedicated tax already in place, so it makes a substantial difference.

As we move forward, I know in the Great Lakes case they are putting together state funds to do a larger part of what was once only a Federal responsibility. So as we get into those kinds of programs, perhaps we can devise a system that will be able to take advantage of the state initiative with a matching kind of Federal program.

We want to thank you very much for your interest, and we are looking forward to working with you, especially as the appropriations process moves forward.

Mr. DICKS. We will help there. We realize how important that is.

Mr. NOWAK. Thank you very much.

[The prepared statement of Mr. Dicks appears on page 231.]

Our next witness is the Honorable Thomas Bliley, who is a representative from Virginia.

Congressman Bliley.

TESTIMONY OF HON. THOMAS J. BLILEY, JR., A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF VIRGINIA

Mr. BLILEY. Thank you, Mr. Chairman. I want to thank you for your kind invitation to come before your subcommittee this morning.

As you noted in your opening statement, the Federal Water Pollution Control Act includes a great number of important water quality programs. Today I would like to highlight one very important aspect of the law that to the American cities appear like ominous storm clouds gathering in the distance. I am referring to the Combined Sewer Overflow Control Strategy.

Combined sewers are found mostly in America's older cities. They were used before the development of wastewater facilities to transport sewage away from the city, and to a nearby river, lake, stream or ocean. When water treatment facilities were later built, new sewer lines were connected to the old to carry away the sewage to the treatment plant.

Unfortunately, these connecting sewers were made only to carry normal wastewater flow. During heavy rains, the connecting lines have filled and the excess spills into the old sewer lines which flow directly into the stream. This occasional incident has been determined to be a threat to our environment.

CSOs are a unique water quality challenge. The number, size, frequency of discharge and the cost to control differs from city to city and CSO to CSO. Of course, this variability calls for flexible regulations that allows for a number of different responses.

In August, 1989, the EPA issued its final national Combined Sewer Overflow Control Strategy. This document required all states to develop a state-wide strategy by January 15, 1990 for the development and implementation of measures to reduce pollutant discharges from CSOs. This strategy will affect approximately 1,200 sewer systems nationwide, serving a population of 43 million people. Documented needs for approximately two-thirds of the CSO control measures total $16.4 billion.

According to the EPA, this figure represents a mere 20 percent of all water facility needs in the country. In Virginia alone, the cost of correcting the extensive CSO problem in Richmond, Lynchburg and Alexandria is estimated to be in excess of $450 million. This figure is in stark contrast to the $40 million that Virginia received last year in Federal funds for all water treatment and sewer construction projects in the state.

The City of Richmond, which has a $294 million CSO plan, faces a dilemma that aptly illustrates the negative financial impact on localities nationwide if the current CSO strategy is implemented. The local cost of the first phase of Richmond's CSO plan, $73 million, has already raised wastewater utility rates 70 percent over a four-year period. The City is committed to spending another $27 million, the upper limits of its financial capability, to begin the second phase of its CSO plan. This will increase rates another 16 percent the first year and will average 10 percent over a ten-year period.

Richmond's rates are now among the highest in Virginia. Additional planned expenditures for CSO control will raise them even higher. Later this morning, you hear from the Honorable Gilene Williams, Mayor of my hometown, Richmond, who will go into further detail about the impact of this regulation on our municipalities nationwide. Mayor Williams has done a tremendous job, not only in responding to the financial crisis facing the City of Richmond, but also of founding and leading the National Organization of Affected Municipalities, the CSO partnership.

Without Mayor Williams and her committed staff, I do not think this CSO problem would have made it this far on our Congressional agenda.

Mr. Chairman, I strongly support the environmental goals of the CSO control strategy, yet I am very concerned about the burden this strategy could place on our localities. I would like to be sure that this strategy is the most sensible, effective and efficient method for reaching our goals. For this reason, I respectfully request that your Subcommittee hold a separate hearing to explore the many facets of the CSO issue.

I believe that the funding dilemma alone warrants Congress' attention to the CSO issue. However, there are other aspects I feel Congress should address. Answers to a number of questions should be explored, such as is the intent of Congress being executed? Does EPA's final strategy incorporate the proper flexibility to allow localities to make a response commensurate with the environmental goals and their financial abilities? Are state water control boards' interpretation of the strategy consistent with Congress' intent?

Mr. Chairman, the unique CSO problem demands a unique approach. I would like to join you and this subcommittee in addressing this problem before our cities are faced with very stormy weather.

Thank you for this opportunity, and I look forward to the day when we can examine this question more closely.

Mr. Nowak. Thank you very much, Congressman, for taking the time to appear before the committee.

We have known of your interest and met with your mayor several months ago, trying to develop some new thoughts and see where the technology base is for this CSO problem. We are learning, not only in Richmond, but in several cities throughout the states where the investment has been made, as you rightly pointed out, in secondary treatment. The water quality is not significantly improving, not because the plants are not operating efficiently, but because of these CSO problems.

As we look at the program of grants to the states, we know it is going to be totally inadequate, and more and more communities are coming to the forefront and looking seriously and analyzing the CSO problem and finding that the impacts of the overflows are very, very dramatic. We have to find a federal response to some degree to encourage that kind of program, if we are going to have the total success we want and the end result of cleaner water and meeting those swimmable, fishable goals.

We will be working with you, and I will be talking to EPA more specifically about this problem, as well as some of the other funding problems. But we hope that we can also form a consensus among the states this year, and have them come forward with a consensus of what they would like to participate in, and how they feel we could at least have a start on this program.

As you know, CSOs back in 1980 were eligible. We took them out of the eligibility category in 1981, and concentrated on the basics of secondary treatment. But I think the results have shown that we really should have done both, or at least made an attempt to get the total achievement of water quality by looking at total impacts into our waters throughout the country.

So we will be focusing on this very seriously, and as we move along hopefully we can get back to you with that progress, and urge your support in this challenge we have ahead of us relating to CSOs.

Thank you very much for coming.

Mr. BLILEY. Thank you.

[The prepared statement of Mr. Bliley appears on page 229.]

Mr. NOWAK. Our next congressional witness will be Nita Lowey, who is also from New York, a state that I am familiar with. Congresswoman Lowey also has a particular problem.

We will of course incorporate your full statement into the record.

TESTIMONY OF HON. NITA M. LOWEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Ms. LOWEY. Thank you, Mr. Chairman. I appreciate this opportunity to appear before the subcommittee today.

It is truly a pleasure for me to appear before this Subcommittee because the Chairman has such a distinguished record of support for the environment, and for clean water in particular. The other members of the subcommittee have distinguished themselves on this issue as well.

I come before you today to discuss the pressing need for Federal funding to upgrade the Mamaroneck Sewage Treatment Plant in Westchester County, New York. This is a matter of urgent importance, not only to my congressional district, but to the entire Long Island Sound region.

Let me be frank. Long Island Sound is in danger of dying. If it dies, there will be severe consequences, not only for my congressional district, which borders on the western portion of the sound, but for an entire region of New York, Connecticut, and even Rhode Island. Unless we begin work now to reverse the decline of this vital estuary, we will suffer losses of unimaginable proportions—economic losses, recreational losses, the loss of our very quality of life.

Already, fishing and shell fishing have been harmed severely. Beaches are closed on a regular basis. The picture ahead looks bleak unless we act now to begin serious cleanup efforts.

Currently, the EPA is completing the Long Island Sound Study, which is a comprehensive review of the pollution problems that are now facing the Sound. However, some of the findings have already become available, and they suggest that one of the most important problems facing the Sound is the lack of adequate treatment of waste water.

The Mamaroneck sewage treatment facility is the only sewage treatment plant in the entire Long Island Sound region which is currently operating as a primary treatment facility. It serves 79,500 people and is located near some of the most frequently closed beaches on Long Island Sound.

That is no coincidence. After every rainfall of over half an inch, the four Mamaroneck beaches must be closed for up to three days because of high bacteria counts. But it is not only the Mamaroneck area that is affected. The inadequate treatment provided at the Mamaroneck sewage treatment facility is harming the quality of water throughout the Sound region. An upgrade of this plant is one of the most important steps we can take to help save the Sound.

There are efforts underway to upgrade the Mamaroneck facility to the secondary treatment level, and the Federal Government has contributed somewhat to these efforts. However, the contributions have not been sufficient, and they threaten to leave our local communities with a choice between an environmental calamity or tax increases so burdensome that they are unthinkable.

When the upgrade of the Mamaroneck plant was first conceptualized, the cost of the project was estimated to be approximately $70 million. Since then, projected costs have risen by more than $60 million. At the same time, budget cuts by the Reagan and Bush Administrations have deprived Mamaroneck of much-needed federal dollars. The result is a shortfall in funding that threatens to prevent completion of the project or require a tax increase to local taxpayers of more than 400 percent.

Mr. Chairman, no community should be faced with such a choice, particularly when they are attempting to fulfill a mandate that was established by federal law. Instead, the Federal Government should provide additional assistance to this community which is struggling with the enormous costs associated with completing this project of critical regional significance.

We all recognize that environmental protection must be a top priority for our nation at this time, not because it is nice to have a clean environment, but because it is essential to our future as a nation. We must preserve our national resources if we hope to ensure our economic strength and protect the health of our children.

Nowhere is this more than in the Long Island Sound region. Our economy and our very quality of life depend upon a clean and healthy Sound. Unless we upgrade the Mamaroneck facility, water quality in the Sound will continue to deteriorate, and the future of our entire region will be called into question.

Mr. Chairman, I have great respect for your record on this issue. Not only have you demonstrated your understanding of the importance of clean water to the future of our nation, but have repeatedly acted to protect our environment and to preserve our precious national heritage.

I am grateful to you for listening to my testimony, and I am very hopeful that I will be able to work closely with you and the other members of this committee in addressing this very crucial issue in the months to come.

Thank you, Mr. Chairman.

Mr. **Nowak**. Thank you very much, Ms. Lowey.

We have looked at your particular problem, and it is somewhat unique. Although when we have other members contact the subcommittee, and in fact we are now receiving calls from town officials and village officials, expressing their desperation, wondering where to go and how to proceed with the upgrading of some of these plants that have not been in line for one reason or another to achieve that upgrading during what some call the golden years of the grant program.

As we move forward, we realize that there are going to be specific instances like this that can at this time pull themselves together. One question will be what are we going to look at in terms of local funding for the progress that we really mandated here in the Congress, and now have withdrawn the wherewithal or the partial assistance to accomplish it.

If we relay it over to the local ratepayers, this kind of enormous amounts of dollars that they will have to put out, I don't think they will make that total commitment, and we are not going to make the kind of progress that the Act calls for and the goals that have not been met already.

So we are very cognizant of this particular problem, because of your work in this area, and we will certainly bring this to the attention of all the members as we work through the legislation, as well as to the attention of EPA. We have to solve some of these with some type of incentive. Many of us thought removing the grant program, going to the loan program, would not help us further achieve the goals. We have to rethink some of that spending that we have eliminated, as well as something like CSOs, that you just heard. That may be a large part of the contribution.

But certainly the moving from primary to secondary is basic—that has to be done, and we have to find a way to motivate all the communities to at least achieve that. So we thank you for your testimony, and we will be looking forward to sharing other responses we get, especially from such organizations as the League of Cities and other contacts we will be having with the states, to see if we can't bring forward a solution, especially to this kind of unique situation.

Thank you very much for appearing, and we will get back to you.

Ms. **Lowey**. Thank you, Mr. Chairman. I appreciate your understanding, and your consideration of the problem in this area.

Mr. **Nowak**. Our next witness will be from the U.S. Environmental Protection Agency, the Honorable LaJuana Wilcher, who is the Assistant Administrator of Water. She has been sitting here through the first part of the testimony and now will come forth with all our solutions.

Welcome to the witness chair, and we will accept the full text of your testimony into the record.

TESTIMONY OF LaJUANA S. WILCHER, ASSISTANT ADMINISTRATOR, OFFICE OF WATER, U.S. ENVIRONMENTAL PROTECTION AGENCY

Ms. WILCHER. Thank you, Mr. Chairman. It is indeed a pleasure to be before you and the other members of the committee today to discuss with you the reauthorization of certain portions of the Clean Water Act.

As you know, many of the authorities and programs in the Clean Water Act which were reauthorized in the Water Quality Act of 1987. Expire after fiscal year 1990 or 1991. On behalf of Administrator Reilly, I am requesting that the programs which I will shortly describe be extended through fiscal year 1992.

First I would like to address the allotment formula under Section 205(c) of the Clean Water Act. Under that section of the act, EPA allocates Title II construction grants and Title VI capitalization grant appropriations among the states. Of course, the construction grant program will no longer be allocated after this year. We recommend that the formula itself be reauthorized by Congress in order to be able to allocate revolving funds monies. Of course, Congress in its discretion has the opportunity to develop whatever formula it wishes to allocate these funds.

We do recommend, though, that reauthorize the allocation formula and EPA's Title VI authority to allot funds.

The following eight programs that I will discuss briefly have expiring authorization levels in fiscal year 1990 or 1991 for which we are requesting extensions. We are recommending for fiscal year 1991 that these programs be authorized at the level contained in the 1991 President's budget request. For all of the programs we will be discussing we are recommending such sums as may be necessary for fiscal year 1992.

I would like to briefly mention Section 104(u) (1) and (2) of the Clean Water Act, which will expire after fiscal year 1990. We would like to continue the surface water monitoring and operator training programs that are authorized under those sections. We see these types of programs as being essential to protecting not only the water quality of this nation, but also the federal investment that has been put into these programs to date for the construction of wastewater treatment facilities.

To make sure that training of the operators will continue so that these facilities can be operated properly, and that maintenance can be properly done at appropriate times is an essential part of any type of regulatory program, and that would certainly be high on our list.

Second, we ask that the grants to the states under section 106 of the Act be reauthorized. These grants of course have been administered by EPA under the Clean Water Act since 1973. They are essential to helping our state partners carry out their increasing responsibilities under the Federal programs. The program does expire after fiscal year 1990, and we recommend its extension to continue the state framework for addressing water pollution.

Third, I would like to ask that funding for the Chesapeake Bay program, authorized under section 117(d) of the Act, be reauthorized. That program also expires in fiscal year 1990. Like the Puget

Sound problem, and others, concerns of the National Estuary program, The Chesapeake Bay program brings together federal government entities, state governments and local governments to work together to improve the quality of the environment and to try to prevent pollution from entering that water body.

This has been a successful program we believe, although there is certainly a lot more work remaining to be done. In areas such as reducing the phosphorus floating into the bay, we have seen improvement, and we are seeing species of fish return now that we were once very concerned about. However, we do recognize that much more needs to be done to protect the Chesapeake Bay and would ask that the support for that program for the Federal Government to meet its responsibilities along with the state governments and the District of Columbia, be refunded for fiscal years 1991 and 1992.

Another program that is a geographic type initiative is the Great Lakes program. Under the program we have completed a good bit of study and now want to move toward implementation of remedial action plans and of lake-wide area management plans. To implement some of the recommendations of the studies completed on the Great Lakes we recommend that funding provided under section 118(h) be reauthorized. The authorization does not expire until after fiscal year 1991, and we would recommend that it be extended through fiscal year 1992.

Next section 304(k) of the act enables us to enter into agreements to work with the other federal agencies to deal with water quality problems and authorizes funds. EPA currently has interagency agreements with the Department of Agriculture, the Department of Interior especially, as well as other federal agencies.

We are interested in working with these agencies in areas concerning non-point source pollution and agricultural practices. We believe we can accomplish the most if we work cooperatively and put our federal heads together and try to help both the state and local governments develop solutions to some of the non-point source problems we have.

As we know, the non-point source pollution problems currently are our greatest water quality problems. We have made a lot of progress through the leadership of Congress, and the hard work of people at EPA over the years in addressing many of our non-point source pollution problems. We now know that most of our water quality degradation is in fact coming from these non-point sources. We are very interested in and committed to working toward solutions for non-point source problems, and we believe the interagency agreement program is one of the best ways to do that.

Next, to follow up on the non-point source discussion Congress authorized $40 million in fiscal year 1990 for the section 319, non-point source management program. Most of this money is going to states to help them implement state-approved non-point source management plans.

The Administration has asked for approximately $15 million in non-point source funding for fiscal year 1991, which I will add, is the first time the administration has ever requested money for the program. We are very pleased that the administration has made that request, and would very much like to continue our work with the states and other agencies to try to address this significant pollution problem.

Next with respect to the national estuary program as the other witnesses today have testified, we believe this is a very valuable program. It identifies estuaries of national significance and brings together that very important combination of Federal, state, and local authorities to try to resolve estuarine problems. We have expanded the program over the years from six initial projects, and we expect by fiscal year 1991 there will be 16 national estuary programs in various phases of development. Section 320(i) which authorizes funding for the program, expires after fiscal year 1991, and we would like to ask that that be reauthorized in fiscal year 1992.

Finally, we recommend Congress reauthorize funding for Section 517 of the Clean Water Act. That is a fairly broad-based section authorizing EPA to carry out various activities for which no specific authorizations exist, but it is the section which funds EPA's development of effluent guidelines and implementation of the pre-treatment programs that are so important in keeping toxics out of our nation's waterways. Funds from this section also maintain data systems and essentially perform a lot of other activities to prevent pollution in our nation's waters.

This authorization expires after fiscal year 1990, and we are recommending that it be extended to allow us to do our daily business.

I would like to thank the members of the committee for the opportunity to give this testimony. At this time, I will be happy to answer any questions any of you may have.

Mr. NOWAK. Thank you very much.

We have, as you heard very briefly this morning, other programs that contribute greatly from the states and municipalities points of view to cleaning up some of the other problems that are surfacing. Certainly, the non-point initiative and funding will aid greatly in that effort.

I would like you to comment, if you will, on the Combined Sewer Overflow problem that seems to be growing, at least in terms of its contribution to polluting the waters and streams, especially around the cities that have those systems.

Ms. WILCHER. That is a significant and very challenging problem for us as the Federal Government, and for the states and municipalities to meet. From another perspective, when I was in private practice before I returned to EPA earlier last year, I represented municipalities on wastewater treatment issues.

So I believe I bring to this office some understanding and appreciation for some of the difficulties that municipalities are facing, and particularly the smaller municipalities, as they try to meet their obligations under the CWA requirements and the Safe Drinking Water Act requirements.

In general, I believe that assisting municipalities to meet their obligations is going to be one of the more challenging endeavors I will be facing during my tenure as assistant administrator here.

With regard to CSOs, we know it is indeed a problem. Estimates of between 15,000 and 20,000 CSO discharges currently going into our nation's waterways have been made. We think that there may be approximately 1,500 municipalities that have combined sewers which are holdovers from earlier days when, I think as you mentioned, there was not the type of wastewater treatment that we as a nation now see.

Mr. **Nowak**. In the 1988 survey I think, there were documented needs in this area, the costs for correction was about $16.4 billion. I am wondering if we could determine, working along with EPA and the states and your offices, where you have a particularly heavy impact from CSOs, and if that program should not at least be brought back into the federal kind of eligibility, as a first step.

I have other thoughts as to where we should do a little more. Suppose you had an investment made and you had after that investment a showing of 48 percent or 52 percent of the pollution is caused directly by sewer overflow?

Ms. **Wilcher**. There are two questions in one. First, you want to know what we are doing to quantify the need, and second what type of funding might be appropriate in response. In August of last year, EPA sent out the Combined Sewer Overflow Strategy in which we asked the states that have CSOs, and there are something like 40 of the 50 states that do, to submit state strategies.

Approximately 35 states have submitted strategies and EPA currently is reviewing them. From these strategies we hope to gain more information about the extent of the problem.

We have asked the states to identify the communities that they have CSOs and each discharge point to identify which of those are permitted, and which are not. We hope this effort will help us to quantify the problem.

I am well aware that indeed under the state revolving fund program if a state has met its first use requirements—the state has insured that the municipalities fall within the national municipal policy, or are on a schedule to do so, that the POTWs have achieved secondary treatment—then they can use the state revolving funds to address CSO problems.

To date several billion dollars already have been put into the state revolving fund program, and in 1991 through 1994 we expect about $10 billion more from both the Federal and state governments to go into the state revolving fund. Over the next 20 years, as those funds are invested and repaid, we are expecting over $20 billion to be available for addressing needs.

The first place to look for funding to address the CSO problem is the state revolving fund.

Mr. **Nowak**. It is my understanding that the CSO funding is available under the governor's so-called 20 percent discretionary fund, and the funding may be increased upon the request of the governor to address their particular water quality problems. I wonder through with the enormity of the cost involved here if that is going to be enough with all the other problems that they are facing for them to achieve any meaningful results in this area.

Ms. **Wilcher**. As I said, we expect over the next 20 years for there to be over $20 billion available through the SRF. Realistically, I don't expect that to meet all the needs for CSO funding. We don't have that need quantified now. We are trying to make the best estimates that we have. But that brings us, then, to saying we aren't sure exactly how much is needed, but probably more than the Federal Government is putting in.

So how do we achieve the balance between Federal Government contributions, state government contributions, and the municipal government contributions? Of course, you have been here for many years and been responsible for much of the construction grants program. You are aware of how much the Federal Government has extended to try to aid municipalities in meeting their secondary treatment needs.

We will be looking forward to working with you to try to determine what the right balance is for the Federal Government dollar, and for the states and municipalities, in trying to address these serious needs.

Mr. NOWAK. We would be very happy to receive your analysis of those state strategies that were sent to you concerning this problem, and the others, to see how we could move forward. Our concern, of course, is that the $20 billion really represents current needs for secondary treatment plants that that even makes it $20 billion.

Ms. WILCHER. We are trying to work with the municipalities to identify the least expensive treatment technologies and the least expensive measures for dealing with the problem.

I would like to add that—and we hope that municipalities are stepping up to addressing the dry weather sewer overflows. There are a number of municipalities that have problems of untreated wastewater going through the sewer overflow system into our waters in dry weather. In our strategy that is a principal area we believe should be addressed.

Mr. NOWAK. One other general question. In your testimony you recommended to us that we look at extension of authorizations of only two years for those expiring in 1990 and one year for those expiring in 1991. As you know, traditionally, the Act has been authorized for a five-year period, and part of that longer look has always been the problem of states reacting and municipalities reacting, getting some consistency, and probability into the program so that it can be reacted to, and have that longer period for compliance.

Why the limitations on these extensions?

Ms. WILCHER. Simply because it was our expectation that we would be working with this Committee to reauthorize the entire Clean Water Act in 1992, and that it made some sense to address the program as a package, rather than piecemeal.

Mr. NOWAK. We now turn to other members and we will have other questions to submit to you, and also before we do that, I will have other requests that we have received, I would like you to review and perhaps comment on as we go through this whole reorganization.

I wondered if you could comment also on the total kind of impact that you see—you had mentioned earlier in your testimony—the total impact you see from the non-point initiative that you have recommended. Do you have statistical information in certain areas where that it is a more significant contributor to the pollution in bodies of water?

Ms. WILCHER. Yes, sir. We know from our latest 305(b) report, which hopefully will be sent to Congress soon, that the states have surveyed designated stream uses and have estimated that about 27 percent of the assessed lake acres are not fully meeting the water quality standards. This degradation is caused by non-point source pollution problems. About 27 percent of the assessed lake acres, and I believe about 30 percent of our assessed river miles are in that category.

We know that more than half of our water quality problems are now coming from non-point sources of pollution which includes urban stormwater runoff and agricultural runoff.

Mr. **NOWAK**. We will now hear from our minority leader from California, Mr. Packard.

Mr. **PACKARD**. Thank you, Mr. Chairman.

Ms. Wilcher, last year the administration requested for the state revolving fund $1.2 billion. This year you are requesting $1.6. We funded last year I think about $2 billion, or something in that neighborhood. Can we read into this that there is a change in the desire by the administration to draw down the amounts that are being requested for the state revolving fund? In other words, is there a greater commitment to that, and are we going to see a trend now of a higher request on an annual basis, or is there still a trend to lower annually that revolving fund?

Ms. **WILCHER**. Mr. Packard the state revolving fund program ends in fiscal year 1994. On the other hand, in preparing this year's budget, because of a variety of needs that have arisen, and of the administrator's and the President's commitment to protecting water quality, it seemed appropriate to ask for the $1.6 billion. While it was an increase over the last year's request, we believe that the needs are there.

Mr. **PACKARD**. That's not quite the answer I wanted. I wanted to know if there is a change in the attitude or in the commitment toward the revolving fund, or is it still a desire to generally reduce that looking forward to the sunset time. Recognizing that Congress very well—if it is a successful program, and it seems to be, and the states are still calling for greater and greater amounts—Congress would likely reauthorize or renew it, and not allow it to sunset in 1994. But of course, that's another day.

Is there a greater commitment toward this because of the increased request?

Ms. **WILCHER**. I believe the commitment remains the same to continue funding through 1994. I don't really see there being a change in the commitment to the program at this point; although there are always decisions concerning the level of funding in each budget.

Mr. **PACKARD**. Thank you.

Could you give us some additional information on the initiatives that EPA is pursuing with the Department of Agriculture relative to wetlands problems and water quality problems generally as it relates to agriculture?

Ms. **WILCHER**. Yes, sir. We have been working with the Department of Agriculture on the President's water quality initiative. Dr. Harry Mussman is the Deputy Assistant Secretary for Science and Education at the Department of Agriculture. He has led an interdepartmental agricultural policy committee that consists of representatives from EPA, the Department of Agriculture, USGS, and NOAA. These representatives have begun to meet and will be making policy recommendations to the Secretary of Agriculture concerning issues surrounding the water quality initiative. That is one step.

Additional steps include our joint participation on the Domestic Policy Council's Interagency Task Force for Wetlands Protection. Further, we have worked with the Department of Agriculture on working groups during the past year and a half in preparation for the 1990 Farm Bill proposal.

That was something that from a personal standpoint I found very gratifying. I started my Federal Government career in Washington at the Department of Agriculture in 1983, and when I made the move to EPA, there were a number of people at EPA that were very concerned about Agriculture and its commitment to the environment. There were people at Agriculture, too, who were concerned about what folks at EPA were doing.

I found upon my return in 1986 that the lines of communication are greatly improved through these types of coordinating efforts and through a real effort to work together on some of our mutual concerns.

Mr. **Packard**. In regard to the artificial wetlands versus natural wetlands—could you tell us what your evaluation is as to whether it is a good policy or whether the quality of the artificial wetlands can be rendered to be somewhat equal to the natural wetlands? I would be interested in your comments regarding artificial wetlands versus the natural wetlands and whether we ought to pursue the initiation of artificial wetlands, particular as it relates to wastewater treatment.

Ms. **Wilcher**. We are very interested in looking further into the creation of artificial wetlands and the use of those wetlands for wastewater treatment. I know that we are working with a small flows clearinghouse to try to help small municipalities identify the best ways of treating the wastewater. That is one area in which EPA has been working to try to determine contaminant removal by the artificial wetland. There is a project in Kentucky and in several other states, and we are watching them closely. California, in fact, has, I think one of the more successful programs—was that in your district?

Mr. **Packard**. I think that's in central California, where it is a major wastewater area that has developed into wetland, and of course there are some concerns there.

Ms. **Wilcher**. That's right. I read an article about that but have not seen the site yet. We are going to need to explore as we create ways to meet community's and small municipalities needs and at the same time protect the environment.

Mr. **Packard**. Could those be, or are they or will those kinds of wetlands be included in the no net loss concept that is now being promoted?

Ms. **Wilcher**. Exactly what the no-net-loss concept will be is something that interagency task force will be working on and will develop. So it probably would be inappropriate for me to say now what no net loss would mean because that is something the administration will be taking a position later.

Mr. **Packard**. Thank you very much, Ms. Wilcher. Thank you, Mr. Chairman.

Mr. Nowak. Thank you, Mr. Packard. We turn now to Congressman Laughlin from Texas.

Mr. Laughlin. Thank you, Mr. Chairman.

Ms. Wilcher, I have been receiving complaints for some time about pollution in the Rio Grande River. I certainly do not want to suggest that all of that has come from Mexico. I get the same kind of complaints about air pollution also, but air pollution does not appear to be the topic today, so I will confine it to water.

Can you tell us what is being done to work with the Mexican Government to help clean up the Rio Grande River, or monitor the pollution of that river?

Ms. Wilcher. With regard to the Rio Grande River. I am not familiar with the cooperative efforts we have with Mexico. EPA has elevated its Office of International Activities and is increasing its staffing there to try to work with other governments and address environmental issues and problems.

We found out last week that there is going to be an EPA representative stationed in Mexico as an attaché to try to work more closely with the Mexican government to address problems. If I may, I will try to follow up with a written response to the Rio Grande question.

[The following was received from Ms. Wilcher:]

U.S.- Mexican Efforts on the Rio Grande

EPA's Region 6 has engaged in a comprehensive, multi-media approach to addressing environmental problems on the U.S. Mexico border. The Region is working closely with the Mexican counterpart, SEDUE. Diplomatic agreements are underway and concerns continue to be addressed through the U.S. and Mexico International Boundary and Water Commission. EPA coordinates with the Corps of Engineers, State of Texas, U.S. State Department, Government of Mexico, Mexico City Embassy, and others in decision making processes.

The Region has taken the initiative to develop a cooperative water quality management approach to existing water quality problems in the Rio Grande along the 1600 mile U.S./Mexico border. The main surface water concern is with the discharge of raw, untreated sewage into the river. Approximately nine Mexican cities presently discharge raw sewage into the Rio Grande. The Region is actively working with the State of Texas and Mexican staff to perform water quality modelling, to train the Mexican staff, and to develop information bases necessary to plan scientific wastewater treatment needs.

In Nuevo Laredo, there is a joint international project involving the International Boundary and Water Commission, to collect and treat about 25 MGD (million gallons per day) of sewage presently entering the Rio Grande untreated. Consultants have completed an interim report characterizing the wastewater and recommending improvements to the Mexican preliminary design of the project. This project is pending Congressional action on the budget.

Other areas discharging untreated sewage are Acuna, Piedras Negras and Reynosa. Some 2.5 to 3 MGD of untreated sewage is bypassed from Acuna and pollutes the Rio Grande between Acuna and Del Rio. Piedras Negras contributes an additional 2.5 MGD of untreated sewage to the river. Reynosa discharges treated effluent but does not disinfect, thus, the fecal coliform levels in the Rio Grande downstream exceed Texas Water Quality Standards.

Approximately 100,000 people live in rural El Paso County, the lower Rio Grande Valley and other border areas in Texas which do not have adequate sewage facilities. This lack of services poses potential problems to public health. To alleviate these problems, several activities are proposed including plans to build a new treatment plant.

Funding may be provided through several proposals currently being considered. One, from Representative Soloman Ortiz requests $45 million in Federal grants from the Farmers Home Administration. Two, Representative Ron Coleman sponsored an amendment to designate $15 million of Texas State Revolving Fund to be used in this area. Three, the FY 1990 Appropriations Act for EPA contains a provision that authorizes Texas to set aside $15 million from its FY 1990 construction grants allotment to establish a special revolving fund for loans to residents in 12 Texas counties. The loans to residents will be for connecting their homes to sewer collection systems and water mains, and for making household plumbing improvements. Four, the Senate authorized a State Bond program to provide $100 million or water and sewage in this area. Finally, a State of Texas constitutional amendment requires the State Water Board to allocate $500 million in water development bonds including $200 million for waste water projects.

Mr. Laughlin. I would appreciate that very much. Yesterday, I signed a letter, along with several of my colleagues from Texas, to Mr. Reilly about the air pollution problems, so we will probably be hearing from him on that.

Thank you very much.

Ms. Wilcher. Thank you.

Mr. Nowak. We turn now to Congressman Bob Clement from Tennessee.

Mr. Clement. Thank you, Mr. Chairman.

As you know the 1987 amendments required states to develop and implement programs to control non-point sources of pollution. I understand the EPA has approved the State of Tennessee's final assessment of non-point pollution affecting waters under its jurisdiction.

Is it possible for you today to summarize that assessment for me?

Ms. Wilcher. To summarize our review of Tennessee's particular program?

Mr. Clement. Yes.

Ms. Wilcher. I am sorry, I am not familiar with the specifics of Tennessee's program, but again we can supplement this testimony with a written response.

[The following was received from Ms. Wilcher:]

TENNESSEE NONPOINT SOURCE ASSESSMENT AND MANAGEMENT PROGRAM

Tennessee's assessment of waters impacted by nonpoint source pollution was based primarily on information, The Status of Water Quality in Tennessee, 305(b) Report, prepared in August 1986 and updated in April 1988. The assessment reports that nonpoint source pollution affects 77% of the State's lake acres and 82% of the river acres that were impacted and unable to fully support designated uses. The assessment identified the following as major sources of nonpoint source pollution: drainage from upstream impoundments, agriculture, hydrologic and habitat modification (dam construction, dredging), urban runoff, resource extraction, and construction.

The State's nonpoint source management program includes milestones addressing all these sources of pollution. The management program provides a listing of State activities to control nonpoint source pollution. These activities involve both statewide and watershed specific projects including: providing technical assistance and public education, and implementing best management practices and other nonpoint source controls.

Mr. Clement. I would deeply appreciate it. Could you comment on the non-point pollution problem?

Ms. Wilcher. In general?

Mr. Clement. Yes.

Ms. Wilcher. We consider non-point source pollution to be one of the more significant problems in terms of water quality degradation. It comes from agricultural sources, pesticides, residues, runoffs, and from livestock operations. It also is an urban problem—where there are construction sites, where there is not enough erosion control, and where we have runoff from our streets. It is something that does not have a strict regulatory program, as you know.

We believe it is important to elevating the significance and emphasis on nonpoint source management in each state. We believe the states have a great opportunity to reach out to their citizens and to educate the public and elevate their concern and awareness to these non-point sources of pollution. It is at an individual citizen level that you are really going to be able to see a real difference in how we can move forward to protect our waters from those sources.

Mr. **Clement**. I may have some other non-point questions concerning the State of Tennessee.

Thank you.

Ms. **Wilcher**. Thank you.

Mr. **Nowak**. Congressman Stangeland, our minority leader who was detailed in the Agriculture Committee on very important initiatives this morning, and to which he certainly has contributed greatly not only for the last two years, but he has been very active in this area as you know, which also has a profound effect, as we have mentioned several times today, on our water resources.

Mr. **Stangeland**. Thank you, Mr. Chairman. I am only going to ask two questions, and submit the balance of my questions in writing.

You have not included in your proposal for reauthorization of the Section 314 Clean Lakes program. I am wondering if that is an oversight, or did you intend not to recommend and request reauthorization?

Ms. **Wilcher**. The administration has not asked for funding for that program in the past, and at this time the administration is not asking that it be reauthorized.

Mr. **Stangeland**. There are those of us who believe it is a good program, and it has a good track record and good broad support. It would not necessarily cause heartburn to the administration if we were to include, in spite of your lack of requesting it, am I correct?

Ms. **Wilcher**. I think there is a lot of value to the program, Mr. Stangeland. Again, it is an opportunity for us to bring the Federal, state and local governments together to try to accomplish something, get the local communities involved. I think there have been some real successes in the program.

Mr. **Stangeland**. Prevention is certainly the major goal, but where there has been pollution damage done, we ought to continue on the program of cleanup. I think it is a successful one.

The other question is what is the status and what is the administration's position at this point in elevating EPA to a level status?

Ms. **Wilcher**. The administration has been supportive of that proposal, and I believe it is going to the floor of the House soon. I don't know the exact status of it, but I do know that bills are progressing throughout both the House and Senate sides.

Mr. **Stangeland**. Yes. My counselor advised me it should be on the floor tomorrow.

Ms. **Wilcher**. Yes, I thought it was getting close.

Mr. **Stangeland**. Thank you very much. I do look forward to working with you. I do have other questions, but I will submit those in writing, Mr. Chairman.

[Ms. Wilcher's responses to Representative Stangeland's post hearing questions follow:]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 22 1990

OFFICE OF CONGRESSIONAL
AND LEGISLATIVE AFFAIRS

Honorable Arlan Stangeland
Subcommittee on Water Resources
Committee on Public Works and
  Transportation
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Stangeland:

Enclosed are responses to the questions you submitted to LaJuana Wilcher, Assistant Administrator for Water, following the March 21, 1990, hearing on reauthorization of the Clean Water Act.

I hope this information will be helpful to you and the members of the Committee. If there is any further information we may furnish you, please do not hesitate to contact me.

Sincerely yours,

Barbara Bassuener
for Christopher P. Hoff
Acting Director
Legislative Analysis Division

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Questions received from Congressman Stangeland following the March 21, 1990, hearing before the Water Resources Subcommittee of the House Committee on Public Works and Transportation on reauthorization of the Clean Water Act.

1. **Question a.:** Please elaborate on the special needs of small community treatment plant operators and the opportunities to meet those needs under Section 104(g) and (u) of the Clean Water Act.

Answer 1a: A key factor in compliance problems at small plants is that operators often lack the technical knowledge and mechanical skills necessary to operate, maintain and manage the treatment plant. Typically small plants are operated by one person who is responsible for all aspects of plant operations and maintenance. Often this same individual is responsible for other municipal duties. In many cases there is not time, funds, or inclination for needed classroom instruction or "hands-on" training at a wastewater treatment facility. Low salaries and lack of recognition lead to high turnover rates for small town operators. The problem of inadequately trained operators is often exacerbated by improper facility design, overly complex technologies, inadequate financial management, and lack of effective enforcement of discharge permits to spur corrective action.

Onsite technical assistance as authorized by Section 104(g)(1) of the Clean Water Act provides small communities the opportunity to receive in-plant operator training and financial management technical assistance. Since 1982, nearly $21 million has been spent in grants to States to provide this assistance to cover 3100 communities. The program has been highly successful in returning small plants to compliance. The actual amount appropriated for fiscal year 1986 through 1990 has been less than the $3 million per year authorized by Section 104(u).

In addition, Section 109(b) of the Clean Water Act authorizes EPA to make a grant of up to $500,000 to a State for the construction of an operator training facility. To date, 30 States have received such a grant and two more are in process. These facilities provide classroom training for wastewater plant operators. Many of these training centers have broadened their scope to include training in water supply, solid and hazardous waste management, and other environmental disciplines.

Question 1b.: How is EPA helping to address small community problems that are broader in scope than Section 104(g)'s operator training provisions?

Answer 1b: The work that can be done under Section 104(g)(1) is actually quite broad in scope. In recent years traditional operator training has shifted to increased involvement with both the operator and town officials to address management problems.

The in-depth assistance provided also may identify design and construction problems, improve preventive maintenance, reduce energy and chemical costs, and improve user charge systems.

In addition, EPA has developed the Small Community Outreach and Education (SCORE) program. SCORE's aim is to inform small community local officials that appropriate technology, sound financial management, and citizen support can help them build and operate self-sufficient wastewater facilities that comply with Clean Water Act requirements.

Similarly, other EPA offices, such as the Office of Drinking Water and the Office of Solid Waste, have adopted special outreach and technical assistance programs to help small communities. EPA recently established an agency-wide Small Community Coordinator who will work with program offices to further enhance their focus on small community issues and concerns. Programs such as pollution prevention, cooperative environmental management, innovative financing, and economic analysis of small community regulations will all benefit from this cross-media coordination.

Question 1c.: Finally, please explain in detail -- either how or for the record -- what EPA is doing or is capable of doing under Section 104(g) or other authorities to help Minnesota's "Community Assistance Program" continue to be a success and become a national model.

Answer 1c: EPA has provided some limited financial assistance to the Minnesota "Community Assistance Program." In 1988, EPA , through the Small Flows Clearinghouse, awarded an incentive grant of $10,000 to the Minnesota Pollution Control Agency (MCPA) for a pilot project to set up a "Community Assistance Program." In March 1990, we awarded $40,000 to Minnesota for their base Section 104(g) program and an additional $10,000 from Section 104(g)(1) for the Community Assistance Program. We recognize that Minnesota would like to implement this program on a much larger scale and we feel their program is very successful. However, there was only $1.7 million available through this program to address the entire nation. Realizing that this funding may be insufficient, we have offered to consider an application for a second incentive grant, which is typically about $12,000 each. The purpose of this additional funding is to provide some degree of program continuity until MPCA can find a stable source of funding. In addition, we will continue to pursue other possible sources of assistance. It is our hope that the Community Assistance Program will continue as it is an exemplary program.

2. **Question a.:** Please describe in detail for the record what EPA is doing to foster a better working relationship between EPA Region 5 and the Minnesota Pollution Control Agency (MPCA). The Metropolitan Waste Control Commission, the Metropolitan Council, and others are very concerned about Region 5's apparent lack of deference to MPCA, the agency with delegated permitting authority under the Clean Water Act.

Answer 2a: The Minnesota Pollution Control Agency (MPCA) was authorized to administer the National Pollutant Discharge Elimination System (NPDES) program, as well as the Construction Grants/State Revolving Fund program. They have been operating these programs for a number of years. Throughout that time, the MPCA has done an exceptionally fine job of implementing these programs in accordance with Federal requirements. Overall, the U.S. EPA has an excellent working relationship with the MPCA. To enhance this working relationship and also in response to certain specific issues that have arisen (discussed below) a one day retreat was held between Senior Managers within EPA Region V and the MCPA. The Deputy Regional Administrator, the Water Division Director and Deputy met with the State Deputy Commissioner and Director of Water Programs and selected State managers. At that meeting, a number of issues were explored including communications and overall working relationships. It was a very productive retreat.

On occasion U.S. EPA will disagree with a program decision made by an authorized State has made. Such is the case with respect to three facilities within the State of Minnesota. EPA felt compelled to file a civil enforcement action against two major municipal wastewater treatment facilities owned by the Metropolitan Waste Control Commission and the Metropolitan Council, which serve the Minneapolis-St. Paul region. EPA felt enforcement actions were necessary under the National Municipal Policy, a program to ensure municipal wastewater treatment facilities met the requirements of the CWA by July 1, 1988.

A third area of disagreement also concerns a facility owned by the Metropolitan Waste Control Commission and the Metropolitan Council. U.S. EPA, the State of Wisconsin, and the Minnesota/ Wisconsin Boundary Area Commission objected to a proposed NPDES permit for the main wastewater treatment facility. The U.S. EPA, MPCA and the State of Wisconsin have reached agreement on the requirements for the proposed permit. Discussions are now underway with the Metropolitan Waste Control Commission, the Metropolitan Council, and the Boundary Area Commission.

Question 2b.: Also, please provide a detailed accounting of steps MPCA has taken to avoid unnecessary litigation and pursue alternative dispute resolution and other cooperative, less confrontational measures in addressing pollution problems throughout the Minnesota and Mississippi River region, as well as the rest of the state.

Answer 2b: The only litigation currently underway in Minnesota under the Clean Water Act are two civil cases associated with the National Municipal Policy. Extraordinary steps were taken to avoid litigation which included: a series of meetings between U.S. EPA Region V's Regional Administrator and the Commissioner of the Minnesota Pollution Control Agency; a series of meetings between the EPA Assistant Administrator for Enforcement and Compliance Monitoring and the Minnesota State Attorney General; and numerous conversations between the staffs of EPA Region V and the Minnesota Pollution Control Agency. Because a satisfactory resolution could not be achieved based upon those extensive discussions, EPA felt it was necessary to file the aforementioned civil litigation in order to maintain the integrity of the National Municipal Policy and the Clean Water Act. Since the filing of the action, EPA and the Department of Justice have gone to great lengths to try to resolve the litigation in a manner acceptable to all parties. These efforts have not resulted in a settlement.

It is important to note that a filing of litigation in the State of Minnesota by the U.S. EPA is an extremely rare event. It is a rare event because U.S. EPA and the State of Minnesota have always been able to resolve their differences short of litigation. In the two instances referred to above, notwithstanding extraordinary efforts to resolve the differences, it was not possible to eliminate the need for the filing of the litigation.

The only other litigation filed in Minnesota by U.S. EPA under the Clean Water Act was a case against an industrial discharger. U.S. EPA and the State of Minnesota were joint plaintiffs in that case. The settlement of the case was unique and precedential in the control of toxic pollutants and in the amount of penalties collected and given to the State. This is a good demonstration of the effective working relationship between U.S. EPA and MCPA.

U.S. EPA will continue to foster an effective working relationship with the Minnesota Pollution Control Agency. As stated above, recent efforts have significantly enhanced the already good working relationship and the Agency anticipates that relationship will continue.

3. **Question a.:** Doesn't the Section 314 Clean Lake Program have a proven track record and a broad spectrum of support?

Answer 3a: Yes, we have made significant gains in advancing the science of lake restoration and protection. There is also a wide base of State and local support for lakes programs. Since the benefits are primarily local in nature, we feel this responsibility is most appropriately handled by State and local governments.

Question 3b.: Why is the Administration not addressing the need for reauthorization or seeking any funds for this coming fiscal year (FY 1991)?

Answer 3b: The Agency requests no funding for this program in 1991, which represents a decrease of $8,747,700 in the Abatement, Control and Compliance appropriation. In past years, the Agency has developed and demonstrated lake restoration techniques and assisted States in classifying lakes, identifying techniques for restoring the levels of water quality needed to maintain or enhance uses, and implemented cleanup and control projects. Because the Agency has provided guidance to the States on maintaining clean lakes, it believes that the States are now able to address lake restoration needs, along with other local priorities, under their existing water quality management programs.

Question 3c.: Does this mean the Administration and EPA do not support reauthorization of Section 314?

Answer 3c: That is correct. We have requested no funds for the program in FY 1991, and do not support its reauthorization.

4. **Question:** Please comment on the need for reauthorization of the Section 208(j) Rural Clean Water Program (RCWP). What is the relationship between EPA and USDA and between 208(j) and 319? How can Congress improve current authorities under the Clean Water Act to address rural water quality problems?

Answer: The RCWP has historically been administered by the USDA with the review and concurrence of EPA. The USDA and EPA have worked well together in administering the RCWP in the past. The challenge for the future, which we believe both agencies are prepared to meet, is to assure that rural clean water projects are consistent with and help achieve progress towards implementation of comprehensive State nonpoint source management programs under Section 319. To achieve such program integration, RCWP projects should be located in areas where EPA has approved Section 208(b) plans and in watersheds that are identified as State water quality priorities in State Nonpoint Source Assessments and Management Programs approved by EPA under Sections 319(a) and (b). In addition, it is important to involve State Nonpoint Source Management agencies in the selection, design, and implementation of RCWP projects.

Because water quality monitoring is a key to assuring that a watershed project succeeds in improving or protecting water quality, EPA's FY 1990 nonpoint source grants guidance stresses that watershed projects funded under Section 319 grants to States include a water quality monitoring and evaluation component. To support and reinforce EPA's efforts in this area and to provide a better baseline of knowledge about the success of various control techniques, it would be useful to USDA to also conduct water quality monitoring to evaluate the progress achieved by each of its RCWP projects.

Finally, EPA is promoting implementation of a fairly consistent baseline of NPS control practices and measures in our most troubled or threatened watersheds. Where violations of water quality standards continue after baseline NPS controls are in place, EPA is better equipped to conduct more intensive assessments of water quality and the pollution source(s). Again, it would be useful for RCWP projects to use the same approach, and to conduct follow-up monitoring to help EPA determine whether water quality standards are being met or whether additional assessments and controls may be necessary.

Attachment A

Funding of Clean Lakes Demonstration Projects

Lake, State	Project Phase	FY89 Funds ($)	FY90 Requests	Total
Houston, TX	I	-0-		
Beaver, AR	I	$100,000		$100.0
Greenwood, NJ	II	452,400		452.4
Greenwood, NY	II	369,600		369.6
Deal, NJ	II	604,881		604.9
Alcyon, NJ*		-0-		
Gorton's Pond, RI	I	-0-		
	II	-0-		
Washington, RI	I	98,413		98.4
Bomoseen, VT	II	-0-	$ 588,000	588.0
Sauk, MN	I	100,000		
Worth, TX	I	-0-	2,000,000	2,000.0
	TOTAL	$1,725,294	$2,588,000	$4,313.3#

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* Has received several million dollars from the EPA Superfund Program

# $963,000 was redirected to Lake Champlain, Onondaga, Delevan

5. **Question:** Please provide for the record the amount of funds spent and steps taken to date by EPA to implement the 314(d) $40 million demonstration program and the $15 million Acidified Lakes Program.

Answer: The 1987 amendments to the Clean Water Act (section 314) established the demonstration program. The objectives of the demonstration program are to: develop techniques to control pollution to lakes, particularly nonpoint sources of pollution, and evaluate the feasibility of implementing regional pollution control strategies; demonstrate environmentally preferred techniques for the removal of contaminated lake sediments, silt, aquatic growth, and other obstructions; construct and evaluate silt traps and other devices to prevent the deposit of sediment in lakes; and demonstrate the costs and benefits of utilizing dredged material from lakes in the reclamation of despoiled land. The Act requires that the Administrator of the U.S. Environmental Protection Agency (EPA) give priority consideration to the following ten lakes for inclusion in the demonstration program: Lake Houston, Texas; Beaver Lake, Arkansas; Greenwood Lake, New Jersey; Deal Lake, New Jersey; Alcyon Lake, New Jersey; Gorton's Pond, Rhode Island; Lake Washington, Rhode Island; Lake Bomoseen, Vermont; Sauk Lake, Minnesota; and Lake Worth, Texas.

The EPA policy is to carry out the newly established demonstration program under existing program guidance and regulations. In FY 1989, Congress appropriated $5.0 million for the demonstration program. No funding was appropriated for the Acidified Lakes Program.

Six of the ten lakes named in the Act to be included in the demonstration program applied and were approved for financial assistance. However, Vermont was unable to accept the award for Lake Bomoseen due to the lack of matching funds. A total of $1,725,294 was awarded to the five remaining projects.

In FY 1990 we received applications for two projects, Lake Bomoseen, Vermont for $588,000, and Lake Worth, Texas for $2.0 million. These applications are in the review process, and we expect to make recommendations for funding by the end of May. Since $963,000 of the $5.0 million was redirected to three other lakes, the remaining $2,311,706 will be available for Lake Bomoseen and Worth. Attachment A is a summary of the FY 1989 Awards and FY 1990 requests.

The Administration requested no funds for these programs in FY 1991, and does not support their reauthorization.

Mr. NOWAK. Thank you very much, and thank you for your attendance here today. We will take this initial review and start to——

Mr. PACKARD. Mr. Chairman, before you dismiss this witness, could I ask one follow-up question?

Mr. NOWAK. Certainly. Mr. Packard from California is recognized.

Mr. PACKARD. I would be interested in knowing what the status of the sewage sludge regulations are?

Ms. WILCHER. The sewage sludge regulation was proposed in August of 1988, and thousands and thousands of pages of comments were submitted. EPA had its science reviewed, expects to promulgate a final sewage sludge regulation sometime this year. It represents a very challenging prospect. At the same time, EPA continues to support the beneficial uses of sludge in a safe fashion.

The complex science and policy issues are taking us a long time. But it is something that is a top priority for me, and I am going to try to move it through as quickly as possible.

Mr. PACKARD. It has taken a long time, and I think that's the reason for the question. Is there a way that we could faster track such rulemaking processes—I am not talking about the process itself now, because there may be other rulemaking requirements that we would much prefer not be a two-year process of making rules.

Is it possible we can get input from experts? There are many people in our water and sewer districts across this country that I think would be very pleased to participate in the process of giving their input and their expert advice in many instances. That would probably facilitate and speed up the rulemaking process and assist EPA.

Is it possible we can develop some kind of an input system from a panel of experts that would allow the process to be hastened in bringing in the information rather than waiting for such a long period of time, then sifting through all the different concerns and problems you have struggled with, obviously, in this particular rulemaking process?

Ms. WILCHER. Yes. We would be very interested in doing that. Of course, the folks you are talking about, those people out in the field who do have a lot of experience, are among the many, many people who have already submitted comments. One way to expedite the rulemaking process is through a negotiated rulemaking process. I know that is one approach that was discussed with regard to this particular rule, but a determination was made that this rule would not be appropriate for it.

But there are other cases in which it would be appropriate, and my experience is that it would speed up the process. The negotiated rulemaking process brings together all the interested parties, or at least representatives from each group, and tries to discuss what the proposal should be. That way you get a lot of valuable information up front.

I have participated in one negotiated rulemaking when I was at EPA before, on a section 19 emergency exemption under FIFRA. In that case we brought in environmentalists and the agricultural community, and so on. It was a very difficult rule, but one that I think we got out very quickly because of the process.

In the Office of Water—partly because I felt we had such a positive experience on the rulemaking in 1985—we will be looking for ways to expedite the process.

Mr. PACKARD. I appreciate that comment. I think your idea is well taken, that you could bring in a panel of witnesses, even before you call for comments, to assist in actually formulating and making some decisions early on.

It is very difficult for our water districts to deal with long-term delays in terms of policies and rules.

Thank you very much.

Mr. NOWAK. Thank you very much. We will keep the record open for other questions that your testimony may generate and others will generate over the course of these hearings.

Just looking at making some quick divisions here, in 1991 we have $2.4 million authorized, and we go down to $1.8 in 1992 for the loan program, $1.2 in 1993, and $600 million phasing it out in 1994. Your comment was that amount plus I guess other sources that are within the agency now that will be in the program will produce $20 billion over the next 20 year period. That was the gist of your testimony?

Ms. WILCHER. Yes, sir.

Mr. NOWAK. That $20 billion looks like a lot of money until you look at the other side, you say that the basic 1988 Needs Survey, which I think you have surpassed already, because of more technology out there detecting problems with our waters throughout the United States, and that Needs Survey which takes I guess through the year 2008, talks in terms of $50 billion for presently eligible categories. That is something like $83 billion for all needs in this area. We seem to have, no matter which way we turn, a shortfall. I guess we are going to try to engender some type of program where we can work together with the states, and hopefully with their participation to generate some figure which is going to move the program a little faster forward. I visualize problems coming with added detection and added problems that we have in this area. We are going to be right on the front burner as we move forward in the next couple of years. We will then be attempting to look at the program and see what kinds of additional resources we can bring and where the priorities should be, and we would be happy to work with you and I look forward to getting that state analysis we talked about.

Again, thank you for your presence, and we will get back to you shortly.

Ms. WILCHER. Thank you, sir.

Mr. NOWAK. Thank you.

[The prepared statement of Ms. Wilcher appears on page 327.]

Mr. NOWAK. Could I have Mr. Geren take the chair and take the next testimony? I want to be excused for just a few minutes and then I will be right back.

Mr. GEREN [assuming Chair]. The Chair will now recognize the Honorable Geline Williams, Mayor of the City of Richmond, Virginia.

TESTIMONY OF HON. GELINE WILLIAMS, MAYOR, RICHMOND, VA, ACCOMPANIED BY CARMEN FOSTER, ASSISTANT TO THE DIRECTOR, RICHMOND DEPARTMENT OF PUBLIC UTILITIES; RON BAZARRI, PARTNER, GREELEY & HANSEN ENGINEERS; MONICA OAKLEY, PROFESSIONAL ENGINEER, GREELEY & HANSEN

Ms. WILLIAMS. Thank you, Mr. Chairman and members of the subcommittee. I am Geline Williams, Mayor of the City of Richmond, Virginia, and I have the honor of serving as the Chairman of the CSO Partnership, a newly-founded national organization dedicated to addressing the problem of Combined Sewer Overflows in a practical and responsible manner.

Accompanying me today are Craig DeRemer, Washington Coordinator of the Partnership, Carmen Foster, Assistant to the Director of Public Utilities in the City of Richmond, Ron Bazarri and Monica Oakley, engineers for Greeley and Hansen.

The CSO Partnership was formed by local governments, sewage agencies and utilities throughout the United States to provide a vehicle for developing and implementing practical solutions to the CSO problem. CSOs exist in hundreds of localities throughout the United States where sanitary sewer systems and stormwater runoff systems are interconnected. The combined sanitary and stormwater runoff flows exceed the capacities of these systems during periods of rainfall, resulting in untreated discharges to surface waters from CSO outfalls.

Before describing the CSO problem in more detail and the Partnership's approach for addressing the problem, I would like to take a few moments to tell you something about the CSO Partnership itself.

The genesis of the Partnership was a meeting among cities facing CSO issues from across the United States during the December 1988 annual conference of the National League of Cities. These localities realized that their CSO problems needed to be addressed, that the current law did not provide a framework for addressing the problem in a realistic and practical manner and that the cost of CSO control far exceeded the financial capabilities of most cities.

Interest in establishing our organization grew steadily in the months that followed, as concerned local governments and representatives of sewage authorities convened several meetings to share information and discuss possible approaches to address this crucial issue.

Recently, we incorporated our organization as a non-profit, non-stock corporation, and have hired a coordinator to assist us in our efforts on Capitol Hill.

As you have heard earlier, there are over 1,100 communities in the United States with CSO problems. Several of these communities may be represented through a single jurisdiction or sewage authority. We have been in contact with most of these communities, and I am pleased to report that over 170 localities and sewage districts thus far have either joined or expressed interest in joining the Partnership.

We expect the Partnership's membership to continue to grow as more and more localities throughout the United States with CSO issues begin to realize the impossible regulatory burdens they face with existing federal legislation, and without grant funding.

The Partnership has, and will continue to, work closely with the National League of Cities. The League has adopted policies on CSOs that are consistent with the goals, purposes and policies of the Partnership.

Turning to the CSO problem itself, let me emphasize that local governments are not to blame for the existence of the CSO problem. The combined sewer systems that are the source of today's CSOs were installed many years ago to convey stormwater and sanitary waste away from densely populated areas to protect public health. As a general rule, wastewater treatment was not available at the time of installation of these combined systems. In many instances, combined systems were viewed as a highly innovative methodology, ahead of its time.

Now, however, these systems are a burden to older cities. Unfortunately, these older cities also face a disproportionate share of the ever-increasing costs to provide necessary municipal services and to maintain aging infrastructures in addition to shouldering the costs of CSO control.

Although there are still problems to be addressed, we have made great strides since the early 1970s in providing at least secondary treatment for municipal wastewater flows. As you know, that progress has not been without tremendous cost. In fact, the cost of providing secondary treatment throughout the United States has taken many more years and cost many more billions of dollars than originally envisioned by Congress when it passed the Clean Water Act in 1972.

The problems of achieving secondary treatment nationwide have been difficult and time-consuming. However, these problems pale in comparison to the magnitude of the problems facing individual localities with substantial CSOs. Local governments that have started addressing their CSOs have found that the costs and technical complexity of the solutions are overwhelming. These localities have already spent hundreds of millions in local dollars only to find that hundreds of millions in additional dollars remain to be spent to fully address the problem.

For example, the City of Richmond has already spent or has committed to spend, well over $100 million in local dollars on CSO control over the past 15 years. We need to spend an additional $200 million in 1988 dollars to fully implement our CSO control plan. Additional millions of dollars will have to be spent each year to operate and maintain the CSO controls once they are fully implemented.

The capital costs alone to implement the city's CSO control plan equates to more than $1,300 for each man, woman and child in the City of Richmond. Richmond simply does not have the financial resources to complete implementation of its plan with local funds alone. Many localities throughout the United States face similar problems. These costs may tend to vary from one locality to the next, based on the population, the size and other site-specific factors.

For example, the cost of CSO controls in the cities of San Francisco, New Bedford, Massachusetts, Rochester, New York, and Chicago, Illinois range from $1,300 per person to $5,000 per person. By comparison, the cost of secondary treatment has generally been in the $50 to $60 range. In other words, the average CSO control cost is some 50 times greater than the cost of providing secondary treatment.

The combined costs for CSO control, providing necessary municipal services, maintaining aging infrastructures, as well as implementing other environmental programs such as solid waste, drinking water, and conventional wastewater treatment are staggering, and far exceed the financial resources of local governments. Local governments without CSO problems face difficult times already to meet the increasing costs for necessary municipal services, infrastructure needs, and environmental costs in the years ahead.

Without help from Congress, local governments with CSOs face impossible tasks with the added burden of their CSOs. Federal and state grant funding will be critical to the successful implementation of CSO controls nationwide. Loans will not be sufficient because the cost of CSO controls are so great that repayment of the principal alone will exceed the financial capability of most local governments.

We want to emphasize that we are not suggesting the traditional construction grants approach to the funding of CSO controls where funds are awarded regardless of need. Rather, we are proposing a partnership—a partnership between federal, state and local governments, where local governments spend to the limit of their financial capabilities for CSO controls and the federal and state governments provide the remainder of the money needed to complete the work.

The Partnership is in the process of preparing legislation to provide for federal grant funding on the basis of financial need and water quality benefit. In addition, the legislation will provide for a separate regulatory program for CSOs to take into consideration the unique problems presented by CSOs and the need to address CSOs on a site-specific case-by-case basis.

The Partnership's proposed legislation will provide for a reasoned, balanced approach to the problem that will facilitate the development and implementation of CSO controls nationwide in a responsible and a practical manner. We expect this legislation to be introduced shortly. We ask that the subcommittee give consideration of this legislation a high priority.

On behalf of the Partnership, I want to express my appreciation for the opportunity, Mr. Chairman, to appear today before you and the subcommittee. We look forward to working with the subcommittee to address the CSO problem in a responsible manner.

Thank you very much.

Mr. **Nowak** [resuming]. Mayor Williams, thank you very much.

Would anyone else like to make a formal statement at this time?

We will then proceed. I thank you for a very enlightened statement and a balanced approach to this problem. You mention on the last page of your testimony the possibility of federal grant funding on the basis of financial need and water quality benefit. Could you give us any idea, mayor, or any of your people who are at the table, the general kinds of outlines you are looking at in terms of that legislation that we will look forward to receiving?

Ms. **Williams**. I would be happy to, Mr. Chairman. We are working on a draft of the legislation and expect to present this draft to the Board of Directors of the CSO Partnership that will be meeting in early April in Boston. At this time, would one of you like to speak to the particulars of that?

Mr. **Bazarri**. Mr. Chairman, some of the basic points of that legislation include approaching the permitting of CSOs in a phased manner, and to address the water quality impacts of CSOs on a case-by-case basis based on site-specific studies of the conditions that are created when CSOs are discharged, and to look at the conditions under which CSOs are discharged as opposed to the traditional dry weather conditions or drought conditions under which we look at secondary treatment.

Those are some of the basic points that are included in that.

Mr. **Deremer**. Mr. Chairman, if I might add, also, on the financial aspect—we want to try to lay out a way of analyzing the financial capability of any of the communities. This includes the cities' financial limits and how they should be measured to determine how much a locality can actually afford to pay. By that, we can know what kind of a gap there is that needs to be picked up at the state and national level.

Mr. **Nowak**. That was going to be my next question. When you talk about the limits of the financial capability of a city or town, what criteria are you looking at that is going to give us that limit size?

Mr. **Deremer**. That is one of the questions that still remains. For instance, it can have to do with income, local taxing limits, a whole range of other types of factors. But that is part of what is being reviewed right now.

Mr. **Nowak**. When you look at the benefit side, I assume the legislation is going to relate the higher the benefit, the more participation. Then you would analyze the participation based upon the capabilities, and of course, the Federal Government, if you look at the balance sheet, has no capability. However, the cost and relationship of not performing the work and continuing on with a percentage of the pollution has also a cost related to it, perhaps in terms of increasing vastly beyond the investment that it made could prevent it. I am wondering if that is also part of your equation as you look at that formula that you will be using.

Mr. **Deremer**. It is, sir. That's part of why you need a site-specific kind of evaluation and a long-term plan. In some instances, where some of the minor overflows occur once or twice a year during a heavy, wet-weather flow, the impacts are really negligible. As a matter of fact, they are probably not really able to be measured. In other cases, they can be much more significant, as Ms. Wilcher mentioned about dry-weather overflows, which definitely have to be controlled.

Mr. **Nowak**. I am wondering if you have also looked at the possibility of putting some dollars into research or into new technologies for the control of some of the overflows. Is that presently being addressed by your group, mayor?

Ms. **Williams**. In our case, the City of Richmond had a consultant, Greeley and Hansen, work on a plan for the City. That plan was subsequently adopted by the city council. But in that process, there were several alternatives that the plan suggested we could use for the correction of our CSO problem. We chose what we thought was the best of the options offered to us. So perhaps in that process existing technologies are thoroughly examined, to see what would be best for the particular locality.

As far as new technologies and developments, does anyone here have an idea about that?

Mr. **Deremer**. The legislation does establish a clearinghouse within EPA to try to share among the cities various technologies, whether they are new ones, or ones that have been successful, so that there will be a technology transfer and an ability to use the most effective kinds of techniques.

Many of these techniques are very simple. Sometimes they are just upgraded operation and maintenance programs, or controlling the non-point source, etc.

Ms. **Williams**. If I may, Mr. Chairman, I am sure that the members of the committee know that the CSO problem is not the same throughout the nation. They are not even comparable sometimes. The solutions to them are not the same, either. In our state of Virginia, there are three cities with CSO problems, and the correction to those problems is not the same for the three cities. Each city has its own specific CSO problem that demands a particular concentrated effort to treat that particular problem. One correction plan will not work for another city.

Mr. **Nowak**. Thank you very much. Let me turn to Mr. Stangeland.

Mr. **Stangeland**. Thank you, Mr. Chairman.

Welcome, Mayor Williams. Let me say that you have retained an outstanding individual to be your Washington coordinator. He was one of the counsels for this subcommittee when I first became the ranking Republican, and I learned a great deal about water working at his feet, so to speak. He was one of my trainers.

I would like to know what some specific solutions are and I realize that the problems are varied and differ from city to city. But I am looking at your cost estimates for the magnitude of the problem in comparison to secondary treatment. It is overwhelming.

Realizing the tightness of money here, and the fact that we are phasing out of the wastewater grants program of funding primary and secondary treatment, it is very difficult for us to come up with a substantial sum of money to assist you. Maybe your consultants, Mr. Bazarri or Ms. Oakley, would care to comment on that. What are some of the options and alternatives, and are we always talking now of a joint system or are we talking about two trunk lines, one wastewater, one stormwater, pouring into the same wastewater treatment facility?

Mr. **Bazarri**. In developing the Richmond plan, Mr. Stangeland, about 60 or so alternatives were evaluated and those were sifted down to a final number of about eight or so. Those eight alternatives were basically selected on their capabilities to provide water quality protection, before we evaluated specific cost elements.

So they were the best of the bunch in providing water quality protection.

In the final plan that has been selected, it is basically a combination of technologies. It includes conveyance, collecting the CSOs, transporting them out of highly open public areas, park areas, and it includes in-line treatment of some of the biggest CSOs in the city.

In the City of Richmond—the mayor has talked about each city having to be evaluated on a case-by-case basis, in the City of Richmond, each CSO has a special characteristic. We have had to look at those on an individual basis. For instance, one CSO is basically a covered small river. It is a tunnel as big as a subway tunnel. So the technology to apply to that particular CSO is a bit different than you would apply to a CSO that is an eight-inch pipe.

There are some storage facilities that are part of the Richmond plan. The treatment plant itself, a secondary treatment plant, has a function to operate during handling CSOs. So we have a combination of technologies for the Richmond system. They were all evaluated on a case-by-case basis based on the protection they would afford, and the cost benefit derived from that protection.

Mr. **Stangeland**. What's the level of frequency in Richmond?

Mr. **Bazarri**. In Richmond, for example, in the summertime, which is a critical period, there were an average of about 24 CSO events in the summer. The Richmond CSO control plan will reduce those to an average of about one event per summer. It will also protect the river from any sort of exposure to CSOs for not longer than about 48 hours during the summer season.

Mr. **Stangeland**. Is the overflow always into the river, or are there backups in the lower parts of Richmond that would flood?

Mr. **Bazarri**. Richmond has a total of about 33 CSOs, more than half of those are right along the James River. There is one tributary stream to the James River, Gillies Creek, which includes the balance of them. So they all eventually get to the James River. There are no CSOs that really discharge back up into the system.

Mr. **Stangeland**. What authorization level are you seeking in the legislation for federal participation?

Ms. **Williams**. We really have not finalized our proposed legislation. We will have that for you in early April. So I don't believe at this point I could speak to that.

Mr. **Deremer**. Both the amount and the ways of deriving those funds, which the Chairman alluded to, are issues still under discussion, and something that the Partnership would really like to work with the committee on, because it does have to be innovative.

Also, I would like to go back to the point that this legislation would not only authorize funding. Part of the reason we are looking for an alternative permit program and water quality approach here is to help keep the costs down. Unfortunately, some of the requirements that EPA is putting forth could lead some to try to treat at a secondary treatment level all of their CSOs. That's what is so expensive. If we can have a case-by-case evaluation, and a separate permit program with requirements, that in itself will keep down the cost. That is also the function of the legislation.

Mr. **Stangeland**. Do you have at all, or can you provide for the record a breakdown of the cities that would have a combined wastewater and sanitary sewer line, and separate wastewater and sanitary sewer lines?

Ms. **Oakley**. We do have a list of the 1,100 cities that EPA claims have combined systems, if you would like to obtain that.

Mr. Stangeland. Just for clarification, when you speak of a combined system, I can see a combined system being where you have two separate systems collecting the water and emptying into one wastewater treatment facility, or one system that collects all the water.

Ms. Oakley. Right. A combined system has the stormwater and the sanitary wastewater from streets, the stormwater from streets and rooftops, for example, and the sanitary wastewater from toilets and showers and sinks, all go into the same pipe, in the middle of the street. It is then conveyed through a series of sewer lines to a wastewater treatment plant, or overflows.

Mr. Stangeland. Okay. Thank you.

Ms. Williams. Mr. Chairman, we have a graphic that shows what a combined sewer overflow is, if you would like the Committee members to have a copy.

Mr. Nowak. We will, without objection, incorporate that into the record.

[Ms. Williams' informational material follows:]

Together We Can Rediscover Richmond's Treasure.

When a small band of English explorers sailed upriver from Jamestown in 1607, they were in search of the South Seas and fabulous treasures after their historic landing on Virginia's shores. The real treasure of Richmond, however, was already before them: at the falls of the mighty and majestic James River.

The river is the City of Richmond's most precious natural resource, a gem which claims an integral part of our history and heritage. As the water lifeline for the Richmond community, the James River also provides an environment for wildlife—from bald eagles to smallmouth bass—in a natural setting that recognizes the delicate balance of man and nature.

According to *Field and Stream* magazine, Richmond has the best smallmouth bass fishing in the state of Virginia. The wide range of habitat, from open meadows to marshy areas, encourages excellent bird watching by The Audubon Society. The largest birds, including great blue herons with wing spans of over 7 feet, to the smallest, such as ruby-throated hummingbirds no larger than a thumb, all call the James River their home.

Spectacular scenic views of the river from many parts of the city frame our downtown skyline. The rush of white water rapids in the heart of the city is a unique feature. Our rapids are among the best for rafting in any city in the nation.

Inner tubing, boat cruises, sunbathing, and nature walks along the shore offer residents and visitors alike special opportunities to enjoy the aesthetic beauty of Richmond in a wholesome, natural environment.

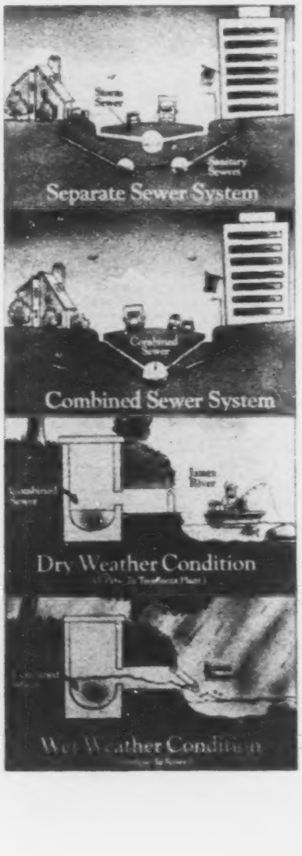
Recognizing the importance of the James River, the City of Richmond maintains the James River Park and encourages riverfront development that protects and enhances this natural and historic resource for our community and for the future. Fish passages are being constructed to enable certain saltwater fish to spawn further upstream in fresh waters, increasing their numbers in a natural habitat.

In addition, to ensure that the waters of the James are maintained for generations to come, the City of Richmond is committed to the control of combined sewer overflows (CSOs).

What Is A Combined Sewer Overflow?

Combined sewer overflows (CSOs) are discharges of a combination of untreated sanitary wastewater from sinks and toilets in homes and businesses and the storm water runoff from areas such as streets and rooftops that wash into the city's sewers. These overflows, which take place during rainfall, occur only in older combined sewer systems that carry both sanitary wastewater and storm water runoff in the same pipe (see illustration).

Combined sewers were built in Richmond beginning in the late 1800s through the early part of the 1900s. Combined sewer systems are found in central areas of many older and densely populated cities around the country. Combined sewer construction was a highly innovative approach, a method ahead of its time for handling wastewater in urban cities like Richmond.



Today, sewer construction involves the installation of two separate sewers—one sewer to carry sanitary wastewater to a wastewater treatment plant and a storm sewer to carry runoff from the rain directly to the river.

During dry weather, combined sewer systems carry all the sanitary flow to wastewater treatment plants. During times of rainfall, however, the amount of rainfall adds to the amount of flow going to the treatment plant. This heavier flow is greater than the capacity of the combined sewer system. When the flow exceeds the capacity, the excess flow is discharged directly to the river at various overflow points in the sewer system. In Richmond, the major overflow points are found on the banks of the James River and Gillies Creek.

What Has The City Done?

The city has a longstanding commitment to maintain and protect the river as our most valuable natural resource. Recognizing the need to protect the river, the City of Richmond has financed several projects, some with federal financial assistance, as part of ongoing and continued efforts to improve the water quality of the river for our community.

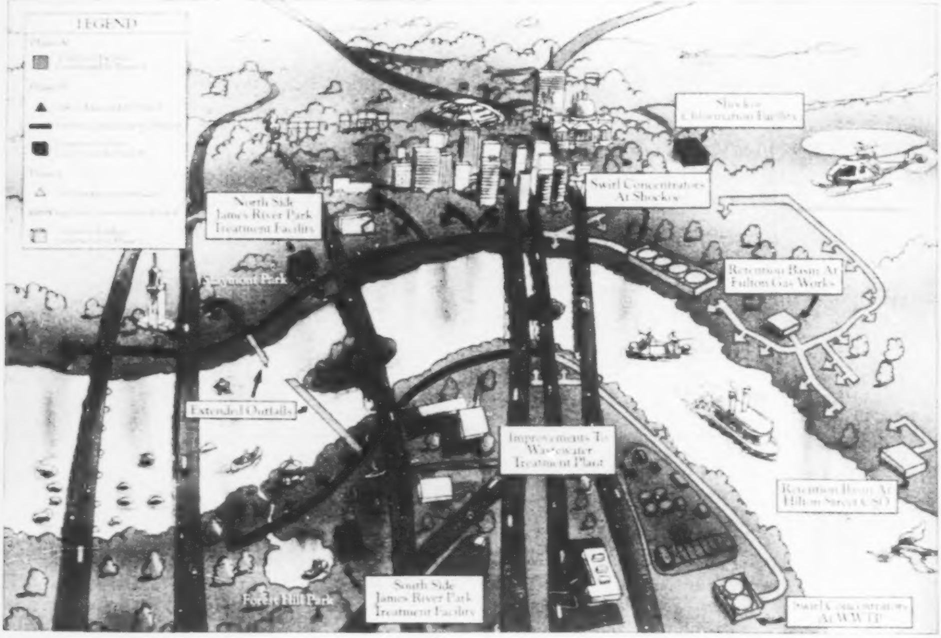
Some Richmond Projects to Protect the James River

Year	Project	Cost*
1950-1956	First Wastewater Interceptors Built Along the River	$15,000,000
1958	Primary Treatment Plant Built	$70,000,000
1958-1974	Completed Intercepting System	$75,000,000
1974	Secondary Wastewater Treatment Plant Built	$70,000,000
1983	Shockoe CSO Retention System Built	$60,000,000
TOTAL		$290,000,000

*1987 dollars

What's Planned For Future CSO Control?

In addition to the projects the city has already implemented to convey and treat sanitary wastewater, a comprehensive CSO Control Program has been developed for further protection of the James River. The City of Richmond expects to implement this



SELECTED PLAN FOR RICHMOND CSO CONTROL PROGRAM

CSO program in three phases as shown (the map illustrates where facilities will be located).

The City selected this CSO Control Program based on a comprehensive study at a cost of $2 million. The study included inspections of CSO sites, assessments of the impact of CSOs along the James River, and public comments. Three public meetings and one public hearing were held during the CSO study to help develop this final plan. Richmond citizens contributed many valuable ideas during the decision-making process. The selected CSO Control Program includes their input.

This three-phase program will cost $294 million in 1987 dollars and is expected to take 12 years to construct, once funding is secured.

Phase A: Wastewater treatment plant improvements will enable the Shockoe CSO Retention System to empty in two days and to collect more combined wastewater. The city has already begun this portion of the program by constructing these important improvements at a cost of $73 million financed by local funds.

Phase B: Underground conveyance pipelines will be constructed on the north and south sides of the James River. These improvements remove and treat CSO discharges from the James River Park areas.

Phase C: Additional conveyance pipelines and treatment facilities will be installed. Treatment facilities will include swirl concentrators and retention basins.

How Are Richmond Households Affected?

Simply put, increased sewer charges will provide the local funding available to pay for a portion of this plan. Richmond residents have already taken on large increases. The current increase to finance $73 million for Wastewater Treatment Plant improvements raised sewer charges 70% over a four-year period. Richmond's sewer bills are now among the highest in Virginia and by state and federal standards are near the upper limit of financial capability.

If city residents were required to shoulder the entire burden of the improvements needed with local funding, the cost just to build the system would amount to more than $5,000 for each wastewater utility user.

The city will be able to contribute about $98 million or 33% of the $294 million needed for the CSO Control Program. Additionally, the city will pay the entire cost to operate the system and for additional improvements that may be needed. Operating costs for the system are expected to double as the CSO Program is completed.

Federal And State Grant Funding

Clearly, the city and Richmond residents cannot afford to pay a total of $294 million in local funds for a 12-year construction project—a cost nearly the same as what has been spent over the last 40 years to maintain the James River. A detailed financial analysis shows that the city has the financial capability to spend $25 million (in 1987 dollars) in addition to the $73 million currently being spent for Phase A of the CSO Control Program. The city is willing to spend to this level of financial capability, which totals $98 million.

However, to proceed with expenditures beyond $98 million could cripple the city's finances and its ability to provide for other essential municipal services necessary to maintain the quality of life for our residents. Still, the commitment to protect the environment of the mighty James remains strong.

The City of Richmond has embarked upon a very aggressive program to obtain state and federal grant funding for the remaining $196 million in capital costs needed to complete implementation of this much-needed CSO Control Program.

"The CSO Partnership," initiated by the City of Richmond, is a rapidly-growing national coalition of more than 130 cities across the country with the goal of developing legislative and federal funding strategies to provide for the control of CSOs.

The total costs for CSO control nationwide are great—in excess of $100 billion over the next several years. For example, San Francisco, California has already spent over $800 million with federal assistance on CSO controls and estimates that an additional $400 to $500 million will be needed to complete its program. Cities nationwide with CSO control costs recognize that a major collaborative effort is needed to address this issue on a federal level.

At the state level, Richmond has initiated a joint effort with the two other cities in Virginia which have CSOs: Lynchburg and Alexandria. As a result, the Virginia General Assembly has established a joint legislative subcommittee (Senate Joint Resolution 198) to study:

- the need for combined sewer overflow controls in Virginia's cities
- the financial impact of these plans on each locality
- the appropriateness of providing state grant funds to these localities to assist them in implementing combined sewer overflow control.

The joint subcommittee will report its findings to the Governor and the 1990 session of the General Assembly.

What You Can Do To Keep the James River A Treasure

All Richmond area residents can ensure that the James River will continue as a legacy for the future by doing the following:

o Bag your leaves and yard trash and have them removed by trash pickup. Leaves that get into the sewer system clog the city's screening devices, causing unnecessary pollution of the James River.

o Recycle cans and bottles or discard them properly in trash receptacles. Cans and bottles which are thrown into curbside catch basins get into the sewer system, also clogging the city's screening devices. When rainfall occurs, these items are washed directly into the river, again causing unnecessary pollution.

o Place foam products such as cups, fast food containers, and similar products in trash receptacles. These products are not biodegradable, and they float when they reach the James River through a combined sewer overflow.

o Use the city's "Supercan" properly to keep garbage off the street that, if not picked up, can end up in the river.

o Be sure to read the directions before applying lawn and garden fertilizers and pesticides. Proper use of these products will reduce the contribution of nutrients and toxins into the James River.

o Used motor oil should be taken to recycling centers and not poured into gutters or curbs.

REMEMBER: ANYTHING PLACED OR POURED INTO CURBS, GUTTERS, AND CATCH BASINS CAN END UP IN THE RIVER.

Finally, contact your elected officials in the state and federal governments. Encourage them to focus on this important issue and the funding necessary to address CSO controls. Together, we can keep the jewel of the James a treasure for years to come.

City of Richmond
Department of Public Utilities

Mr. **NOWAK**. The combined sewer you are speaking of is the first rush of that combination that moves to the plant. When you have an increase, especially in the rainy season, or the overflow is forced because the plant does not have the capacity at those high level entry times to handle all of the flow in the system, when it backs out, that is when you have the overflow of whatever is not taken into the flow or the treatment plant itself, is that correct?

Mr. **BAZARRI**. Yes, sir.

Mr. **NOWAK**. Do you want to explain that more clearly?

Mr. **BAZARRI**. That's basically it. When it rains and the single pipe that is carrying the dry weather sanitary flow and the storm water gets up to its capacity, the excess flows discharge through an overflow point.

Mr. **NOWAK**. What happens if you block off the overflow points?

Mr. **BAZARRI**. If you block off the overflow points and don't increase the pipe size capacity, it is going to come out in the streets or back into people's basements and houses, and buildings, and so on.

Mr. **NOWAK**. That's what people are concerned about. Have they tried that yet?

Ms. **WILLIAMS**. That's right, Mr. Chairman. Right now it is kind of an unseen problem, because it is all beneath the cities, and built over by the city's infrastructure, but they would certainly see it then.

Mr. **NOWAK**. I think you would probably get a higher local contribution then. Let me turn to Congressman Pete Geren from Texas.

Mr. **GEREN**. Mr. Chairman, it is not an unseen problem in my neighborhood. I have seen it in my bathtub. We had some flooding last year in Texas that brought this problem to the public attention in many cities across our state.

The grant program that you talk about obviously would require vesting some entity with a lot of discretion, because there is such a great difference in the circumstances surrounding each of these problems around the country. What sort of entity would you propose vesting with that discretion and authority to make these decisions on where the grants went, if there were grants made available?

Would it go through the EPA? Would it be a separate commission? You mentioned a state-local and federal partnership. Do you envision that entity somehow dispersing these grants, or how would it be done?

Ms. **WILLIAMS**. We are seeking both state and federal assistance to the locality and what the locality can invest in the correction. In Virginia, the state legislature has established a committee studying the CSOs for the purpose of possible state grant funding. It is looking very hard at what may happen at the federal level in assistance.

At the present time, the Virginia State Water Control Board and state water control authorities in other states have the power and the authority to enforce regulation and it is possible that the disbursement of funds could be somehow connected with the state water authority that enforces the CSO control.

Mr. **GEREN**. How would you decide how the federal grant would be apportioned among the states before you get to the Virginia water authority? My question is, if we ended up getting any federal money for this sort of effort, you know it is going to be less than all 50 states. How would that first decision be made?

Ms. Williams. I think it would be that the control plans, the state plans that have been received by the EPA, would have some influence upon that. That is, it would show what each state is planning, and what the size of the problem is state-by-state.

Mr. Nowak. If the gentleman would yield, wouldn't we look at some type of a needs survey to the Federal Government, broken down by state, an analysis of that, then a percentage formula based on the ability of the states and counties and cities to move forward under that needs survey?

Ms. Williams. That sounds very good.

Mr. Geren. Thank you, Mr. Chairman.

Mr. Nowak. Thank you, and again we want to thank you for your very cogent testimony. I think it again reinforces our belief that we have a long way to go in this total program, and if we don't look at it as a total program, and fix pieces of it, or clear up portions of a pollution problem, you are never going to get to the end result and reach the goal that we have all adopted for our country.

I have one other question, and perhaps Ms. Foster could answer this. In your area, you are the director of the Richmond Department of Public Utilities.

Ms. Foster. I am the Assistant to the Director.

Mr. Nowak. You mention a cost of $50 or $60 to go to secondary treatment in your area. Do you have, or could you give me an average now of what the average bill for a two-bedroom family house would be paying in sewer charges, what it was, what it is, and what it could be?

Ms. Foster. I have that information for you now. Congressman Bliley alluded to some of that information in terms of what it will cost and some percentages that will increase for the $25 million to $27 million that we are ready to invest. That will go up 16 percent the first year and 10 percent thereafter.

The current monthly charge for the average household is $22.03.

Mr. Nowak. Twenty-two dollars and three cents?

Ms. Foster. But let me put some perspective on that, so you will understand that for Virginia, those rates just happen to be some of the highest in Virginia from a recent survey of comparable and neighboring localities. For instance, Charlottesville, Virginia is $8.57. So you can see we are already more than three times above that.

Virginia Beach is $18.97. Chesterfield County, which is a neighboring county, but has approximately about as much population as we do, is $14.31, and Henrico County is $15.81.

Mr. Nowak. That's for water and sewer?

Ms. Foster. This is for wastewater service only.

Mr. Nowak. Okay. So it is not for the water bill itself.

Ms. Foster. That's correct.

Mr. Nowak. When you go back, do you have access to all the public utilities, including water, I take it? If you could construct both the water and sewer, separate them out and total them for each of those cities you just gave me?

Ms. Foster. I can do that for you. I have those figures available in front of me right now.

Mr. Nowak. If you will submit them for the record as soon as you work your numbers through.

Ms. Foster. I will do that, sir.

[The following was received from Ms. Foster:]

First, let me summarize the overall costs for CSO control in Richmond, Virginia. As part of its CSO study, the City prepared a thorough financial analysis to determine its affordable limit for additional wastewater programs over twelve years without jeopardizing its overall financial standing and beginning to sacrifice basic municipal services and capital improvements. The costs to Richmond for CSO control needs are as follows:

CITY OF RICHMOND CSO CONTROL COSTS
(in millions of dollars, 1987 dollars)

TOTAL CITY COSTS (to affordable limit)	**TOTAL CSO PROGRAM COSTS**
$98	$ 294

The above cost figures include $73 million in local funds that the City of Richmond already is spending now to implement the first phase of its CSO control plan.

Current wastewater and water rates for Richmond and other Virginia municipalities are provided below.

MUNICIPALITY	**AVERAGE MONTHLY RESIDENTIAL BILL***		
	Wastewater	**Water**	**Total**
Richmond	21.24	13.37	34.61
Henrico County	15.81	11.56	27.37
Chesterfield County	14.31	9.94	24.25
Charlottesville	8.57	9.23	17.80
Fredericksburg	19.61	10.0[illegible]	29.62
Alexandria	13.19	14.53	27.72
Virginia Beach	18.97	16.51	35.38

*Based on March 1990 survey

City residential wastewater rates are projected to rise from $ 21.24 to approximately $42 monthly over the next 12 years (the amount of time currently projected to complete the entire CSO project). This rate projection is based on normal inflation and completion of all other projects required by federal and state regulatory agencies, including construction of the second phase of the CSO project costing $27 million (see following chart).

If the city is also required to implement the remaining phases of the CSO project with no federal or state assistance, the average residential rates, for wastewater only, would increase to over $68 monthly.

CITY RESIDENTIAL MONTHLY WASTEWATER RATES

1989-90 rates	$ 21.24
2001-02 rates:	
Normal inflation	$ 30.38
Mandated federal and state programs (non-CSO)	$ 38.36
$27 million CSO plan, second phase (locally committed)	$ 41.91
Total CSO project	$ 68.36

[rates are cumulative]

A Richmond family's monthly cost for wastewater and water service, using the affordable cost limit for the CSO program, is between 28% and 45% higher than our neighbors in Henrico and Chesterfield Counties. If the City had to finance any more than it can afford for the CSO program, the cost for utilities would simply be too great a burden for the average residential family. About 30% of our households have an annual income of less than $10,000.

Beyond the inability of most localities to shoulder on their own the cost of CSO controls, The CSO Partnership also believes that statutory and regulatory requirements should be modified as necessary to better reflect the unique, site-specific nature of CSO discharges and the resulting effects on receiving waters. CSO discharges are completely different in character and effect from traditional point source wastewater treatment plant (POTW) discharges and cannot be judged generally by the water quality criteria and standards set for a POTW-type effluent. For instance, CSO discharges are intermittent and short-lived, and normally have a large stormwater component.

In its CSO strategy, the U.S. EPA does not rule out applying to CSOs water quality criteria and standards set for a POTW-type effluent. Existing state water quality standards set for a POTW-type effluent and applied directly to CSO discharges could force many cities to totally separate their sewer systems or to treat all of their CSO at levels comparable to that provided by their wastewater treatment plants. The cost of either such approach would be astronomical with, in many cases, little or no measurable overall improvement in water quality. For instance, the estimated cost to the City of Richmond to separate its sewers is $2.6 billion, or roughly $13,000 on a per capita basis. Spending the huge sums of money necessary for such an approach would be a terrible waste and would severely limit our ability to invest in worthy projects, including other necessary environmental programs.

Developing statuory and regulatory requirements that reflect the unique, site-specific nature of CSOs will ensure that limited federal, state and local monies will be invested in CSO controls only in the most rational and cost-effective manner, and in a manner that protects our precious water resources. As another direct consequence of using our limited funds wisely on CSO controls, we will better ensure proper funding for other necessary environmental programs.

I sincerely hope that the information we are providing on financial impacts is useful to the subcommittee's deliberations. Richmond's CSO endeavors reflect the strong commitment at the community level throughout the nation to resolving CSO problems, but also clearly demonstrate that CSO controls are extremely costly and beyond local affordability. Also, I hope that there will be national guidance that recognizes the unique, site-specific nature of CSO discharges and the counterproductive consequences of arbitrary application of traditional water quality standards or criteria to CSO situations.

Mr. Nowak. I am trying to determine if people are concerned, how much of an impact a dollar a month would be, and where that would take you in terms of a local match. Perhaps when you look at the user tax concept, we are going to have to use that more than we have in the past, look at that as a possible funding mechanism somewhere down the line, for some of these improvements and benefits we talked about.

If some communities are going to be paying a tremendous increase if they go to the ultimate benefit of meeting the goal, and if we are talking about in your case—I will use the numbers 50 to 60 times the present cost for the achievements you have made in secondary treatment. It is going to be difficult, if it is a one-blush cost, maybe you can bond out some of that, then increase gradually. But if you increase your maintenance so much by taking shortcuts on the capital expenditures on the front end, that maintenance may drive those bills a lot quicker than the original investment with less maintenance will do in the future. I assume you have that all balanced in your engineering report.

It would be an interesting case study for us to get that information from your city, because of the great involvement you have had with the mayor and everyone else looking at this problem in Richmond. Perhaps it would give us a good idea of what to expect throughout the Nation.

As you go forward, mayor, with your task force here and your group, we certainly encourage you to move as quickly as you can and perhaps we can coordinate with you over the next few months. If you make any progress in forming a consensus with the state governments that are involved through the National Association of Counties, and the National Association of States, the Governors Conference, I guess they call it, we could perhaps get a broad consensus for all the members here to consider as we move this legislation forward.

Again, thank you for your very excellent testimony, and we look forward to working with you in the future.

Ms. Williams. Thank you, Mr. Chairman.

[The prepared statement of Ms. Williams appears on page 333.]

Mr. Nowak. Our next witness will be Mr. Erwin J. Odeal, who is the President of the Association of Metropolitan Sewerage Agencies, and Executive Director of the Northeast Ohio Regional Sewer District. He is accompanied by Edward O. Wagner, Assistant Commissioner of the New York City Department of Environmental Protection, and Mr. Ken Kirk, the Executive Director of the Association of Metropolitan Sewerage Agencies.

I am told we will also invite to the table at this time Mr. Raymond Miller, who is President of the California Association of Sanitation Agencies, and Manager of the South Coast Water District, and Mr. James E. Murray, Director of the Division of Public Works, Department of Public Services, and Mr. Murray will be testifying separately after this panel.

We appreciate your patience, and let us turn to Mr. Odeal for his testimony.

STATEMENT OF ERWIN J. ODEAL, PRESIDENT, ASSOCIATION OF METROPOLITAN SEWERAGE AGENCIES, AND EXECUTIVE DIRECTOR, NORTHEAST OHIO REGIONAL SEWER DISTRICT, ACCOMPANIED BY KEN KIRK, EXECUTIVE DIRECTOR, ASSOCIATION OF METROPOLITAN SEWERAGE AGENCIES

Mr. ODEAL. Thank you, Mr. Chairman and members of the subcommittee. As indicated, I am Erwin Odeal, Director of the Northeast Ohio Regional Sewer District and President of the Association of Metropolitan Sewerage Agencies, AMSA. Joining me today in representing AMSA is Edward O. Wagner, Assistant Commissioner and Director of the Bureau of Wastewater Treatment in New York City's Department of Environmental Protection, and Ken Kirk, AMSA's Executive Director.

We are pleased to have the opportunity to testify before the Subcommittee, and to provide our views as you initiate oversight and reauthorization for the Clean Water Act.

AMSA is a national organization composed of 114 of the nation's largest public wastewater treatment agencies, serving more than 90 million citizens across the country. We share your goal of restoring and protecting water quality in our Nation. In the years following the passage of the Clean Water Act, our members have made great advances in wastewater treatment, resulting in substantial reductions in pollutants discharged into the environment.

For example, according to a recent pretreatment survey, since the implementation of pretreatment programs, total discharge of metals by AMSA members has declined from 80,870 pounds per day to 18,350 pounds per day—a 77 percent decrease. Additionally, in 1989, AMSA members were among the winners of national EPA awards for industrial pretreatment, the recycling of sludge and facility operations.

This is not to say that more should not be done, but merely to emphasize that the substantial existing investments by all levels of government to date have improved conditions considerably. Our members are clearly treaters of this nation's wastewater, not polluters of this nation's waterways.

It should be noted that this year marks the 20th anniversary of AMSA, an important milestone that we share with Earth Day and the creation of the EPA. In its early years, AMSA worked diligently with the Congress to establish a viable federal funding program to support local efforts in achieving water quality objectives and also to ensure that projects to correct CSOs were eligible for federal grant support.

It now seems we have gone full circle because, in spite of significant water quality improvements, we are still grappling today with the issue of how best to provide the funding support needed to address the unfinished water quality agenda.

As we begin our testimony, there are a few key messages we wish to share with the subcommittee to set the stage for our later, more specific remarks. Let me begin by encouraging you and your colleagues in Congress to continue your oversight of the activities of the EPA as it proceeds to implement congressional actions through the development of criteria and standards and the promulgation of regulations. Consistent and ongoing oversight will ensure that implementation actions parallel congressional intent.

The process of putting environmental programs in place starts with the Congress legislating and the EPA developing regulations. AMSA strongly supports additional funding for EPA to ensure that the appropriate level of resources are available to develop scientifically and technically sound regulations. Critical to the development of sound policies and regulations is a foundation of solid scientific information—"good science" if you will—to serve as the basis for regulatory efforts. Supported by good science, the local level is where the creative potential lies to deal with the next generation of water quality-based problems.

In addition to this good science, new technologies, expanded product bans, expanded technical assistance and information capabilities need to be provided at the Federal level to help pave the way for local efforts directed at improving water quality.

With the enactment of the Clean Water Act in 1972, our members and others looked to EPA to exercise technical and financial leadership in combatting pollution affecting our nation's waterways. The agency's work program, in the wake of the 1987 amendments to the Act, is already substantial, as are the demands resulting from environmental mandates that state and local agencies must grapple with.

It is clear that to ensure a successful response to any new initiatives, the Congress must first be prepared to provide reasonable time frames and ensure that the necessary research, technical assistance and staffing matches the task that you have set out for the country.

AMSA member agencies have had first-hand experience with the problems presented by accelerated, restrictive time frames for the development and promulgation of regulations and standards. We have learned through experience, most recently with regard to the sewage sludge technical regulations, that sufficient time for review and comment—combined with provisions for peer review—can greatly improve the process, eliminate waste resources and assist in achieving sound regulations.

Consequently, we encourage you to support peer review as a major element of all regulatory development processes.

Mr. Chairman, we request to submit for the record a copy of the Peer Review Regulations that were conducted on the Sludge Regulations.

Mr. NOWAK. Without objection.

[The material referred to above follows:]

UNITED STATES DEPARTMENT
OF AGRICULTURE

COOPERATIVE STATE
RESEARCH SERVICE

STATE AGRICULTURAL EXPERIMENT STATIONS

PEER REVIEW

Standards for the Disposal of Sewage Sludge
U.S. EPA Proposed Rule 40 CFR Parts-257 and 503
(February 6, 1989 Federal Register pp. 5746-5902)

Organized by
Cooperative State Research Service Technical Committee W-170

UNIVERSITY OF CALIFORNIA, RIVERSIDE

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COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES
CITRUS RESEARCH CENTER AND
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF SOIL AND ENVIRONMENTAL SCIENCES

RIVERSIDE, CALIFORNIA 92521

July 24, 1989

TO: William R. Diamond, Acting Director
Criteria and Standards Division
United States Environmental Protection Agency

FROM: A. L. Page and T. J. Logan
Co-Chairs, Peer Review Committee

RE: Environmental Protection Agency 40 CFR Parts 257 and 503 -
Standards for the Disposal of Sewage Sludge: Proposed Rule.

Subsequent to your request of January 13, 1989 the Cooperative State Research Service Regional Technical Committee W-170, with the assistance of experts from EPA, academia, environmental groups, and units of state and local government agencies, organized a Peer Review Committee (PRC) which has conducted a review of the above-referenced document. A copy of the review is attached.

The PRC convened its first meeting from April 12 through April 15, 1989 in Washington, D.C. and prepared a first rough draft of the review effort. The final document transmitted herein is the result of many long deliberation sessions, debates, and sometimes spirited discussions.

We commend EPA for their efforts to produce a comprehensive document on the use and disposal of municipal sewage sludge by using modern scientific and technological means. Our review in many respects is critical of the methods which the Agency has elected to use and interpret data. However, we believe our comments to be constructive and will serve to assist the Agency in producing a superior final product.

If we can clarify points made in our review, or be of assistance in the future, feel free to call upon us.

Sincerely,

A L Page
A. L. Page
University of
California, Riverside
Commitee Co-Chair

T J Logan
T. J. Logan
Ohio State University
Commitee Co-Chair

cc: A. C. Chang
L. W. Jacobs
T. J. Logan
A. Rubin

ACKNOWLEDGEMENTS

The Peer Review Committee gratefully acknowledges the sponsorship and financial support of the following agencies:

Association of Metropolitan Sewerage Agencies
Association of State and Interstate Water Pollution Control Administrators
National Association of Counties
National League of Cities
U.S. Conference of Mayors
Water Pollution Control Federation

Special thanks are due Mr. Kenneth Kirk, Executive Director, Association of Metropolitan Sewerage Agencies, for his untiring efforts in enlisting and coordinating the support of the above sponsoring agencies.

We wish to express our appreciation to those colleges, universities and agencies of government for donating the time of their faculties and professional staff to participate in the peer review process.

Arrangements for the meetings of the Peer Review Committee were made by Ms. Janet Hughes, Conference Coordinator, Association of Metropolitan Sewerage Agencies. We acknowledge with thanks her help in handling the many details associated with travel and accommodations for the committee meetings and for coordination of local arrangements at meeting locations.

The committee owes a special debt of gratitude to Ms. Mary Jacobs, The Ohio State University, Ms. Louise DeHayes, University of California, Riverside and Ms. Leslie Webster, University of California, Riverside, for enduring long hours typing working drafts and numerous revisions of drafts to the final copy.

PEER REVIEW

STANDARDS FOR THE DISPOSAL OF SEWAGE SLUDGE

U.S. EPA PROPOSED RULE 40 CFR PARTS-257 AND 503

(FEBRUARY 6, 1989 FEDERAL REGISTER PP. 5746-5902)

ORGANIZED BY

COOPERATIVE STATE RESEARCH SERVICE TECHNICAL COMMITTEE W-170

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L. W. JACOBS, MICHIGAN STATE UNIVERSITY

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SUBMITTED TO:

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U.S. ENVIRONMENTAL PROTECTION AGENCY
401 M STREET, S.W.
WASHINGTON, D.C. 20460

BY:

PRC COMMITTEE CO-CHAIRS:

T. J. LOGAN, THE OHIO STATE UNIVERSITY
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FOREWORD

The U. S. Environmental Protection Agency (EPA), under authority of sections 405 (d) and (e) of the Clean Water Act (CWA) as amended (33 U.S.C.A. 1251, *et seq.*), proposed regulations to protect public health and the environment from any reasonably anticipated adverse effects of certain pollutants which may be present in sewage sludge. The proposed rules (40 CFR Parts 257 and 503, Standards for the Disposal of Sewage Sludge. Federal Register Vol. 54, No. 23 p 5746 - 5902) were published Monday February 6, 1989. They include standards for the final use or disposal of sewage sludge applied to agricultural and non-agricultural land, distributed and marketed, placed in monofills or surface disposal sites, or incinerated. In the proposed rules the Agency asks the U.S. Department of Agriculture (USDA) Cooperative States Research Service (CSRS), Regional Research Technical Committee (W-170) to review the scientific and technical bases of the proposed rule during the comment period. In response, W-170 formed a Peer Review Committee (PRC) with Drs. A. L. Page and T. J. Logan as Co-Chairs. The PRC, composed of 35 recognized experts from academia, government and private industry, met in Washington, DC from April 12 to April 15. They met in assigned workgroups (Monofills/Surface Disposal/ Nonagricultural Land Application, Agricultural Land Application, Distribution and Marketing, and Risk Assessment). Each workgroup was responsible for review and preparation of preliminary drafts of their particular area. During the meeting the whole PRC met numerous times to discuss progress and identify common areas. After the meeting, each workgroup reviewed and edited their section, and then the entire document was reviewed and edited by each of the PRC members. The Co-Chairs and Chairman of each Workgroup met July 8 to July 12, 1989 to revise and edit the complete draft report.

W-170

The W-170 committee and its predecessors, W-124 and NC-118, are CSRS committees formulated for the purpose of conducting regional research. Research projects must be regional in scope and are developed by researchers from land grant universities, agricultural experiment stations, and USDA laboratories within four regions throughout the United States (North East, North Central, Southern, and Western). Project approval involves preparation of a proposal, approval at the local, regional, and national levels. Funds for regional research are allocated under the provisions of the Hatch and MacIntire & Stennis Acts and each participating unit receives funds based upon a formula.

History

Regional research on land application of municipal sewage sludge was initiated in the North Central and Western regions in 1972. Chronology leading to formation of the W-170 committee follows:

-1972 NC-118 Project, "Utilization and Disposal of Municipal, Industrial and Agricultural Processing Waste on Land", and W-124 Project, "Soil as a Waste Treatment System", were approved for a 5-year duration. The projects involved researchers from Land Grant Universities, USDA laboratories, and EPA.

-1977 Recognizing the similarity of interests and objectives between NC-118 and W-124, a national project was proposed that combined researchers from both projects and focused exclusively on land application of municipal sewage sludge. The project, designated W-124 and entitled "Optimum Utilization of Sewage Sludge on Land", was approved for a 5-year duration. The project involved 44 researchers from 15 Land Grant Universities, 3 USDA laboratories, 1 EPA laboratory, 2 municipal wastewater treatment agencies, and TVA.

-1982 A two year extension of W-124 was requested and approved.

-1984 Recognizing the continued need for national research on waste utilization on land, researchers within W-124 developed and submitted a new national project entitled "Chemistry and Bioavailability of Waste Constituents in Soils". The project was approved for a 5 year duration and designated W-170. The project involved 25 researchers from 13 Land Grant Universities, 2 USDA laboratories, 1 municipal wastewater treatment agency, 1 EPA laboratory, and TVA.

Involvement

In addition to the regional research projects, W-170 and its predecessor committees have been directly involved in a number of other activities dealing with land application of municipal sewage sludge:

-1973 Organized and conducted with EPA, the Joint Conference on Recycling of Municipal Sludges and Effluents on Land, held at the University of Illinois. Publication of the proceedings of this early conference provided the stimulus for an extensive program of research conducted by federal, state, municipal, and private agencies.

-1975 Published North Central Regional Research Bulletin No. 170, "Sampling and Analysis of Soils, Plants, Waste Waters, and Sludge: Suggested Standardization and Methodology". R. Ellis, J. J. Hanway, G. Holmgren, and D. R. Keeney, eds. Agr. Exp. Sta., Kansas State Univ.

-1976 Published North Central Regional Research Pub. No. 235, "Application of Sludges and Wastewaters on Agricultural Land: A Planning and Educational Guide". B. D. Knezek and R. H. Miller, eds. OARDC, Wooster, OH.

-1977 Published North Central Regional Extension Pub. No. 52, "Utilizing Municipal Sewage Wastewaters and Sludges on Land for Agricultural Production". 1977. L. W. Jacobs, ed. Coop. Ext. Serv., Michigan State Univ.

-1979 At request of EPA, reviewed "U.S. EPA Criteria of Solid Waste Disposal Facilities - Proposed Classification Criteria", Federal Register, Feb. 6, 1979. Report submitted March 31, 1979.

-1979 At request of EPA, reviewed "Interim Final Criteria", Federal Register, September 13, 1979. Report submitted January 25, 1980.

-1983 Organized and conducted a workshop on "Utilization of Municipal Wastewater and Sludge on Land". This workshop was co-sponsored by EPA, USDA, CSRS, the University of California Kearney Foundation of Soil Science, the U.S. Army Corps of Engineers, and the National Science Foundation.

-1985 Organized and conducted a workshop on "Land Application of Municipal Sewage Sludge". The purpose of the workshop was to bring together researchers involved in land application of sewage sludge to evaluate and summarize their most recent data. In light of this information, the workshop assessed the validity of assumptions made in the risk assessment process on fate of sludge contaminants. Findings of the workshop are contained in a book entitled "Land Application of Municipal Sewage Sludge", edited by A. L. Page, T. J. Logan, and J. A. Ryan, and published by Lewis Publishers, Inc., Chelsea, MI.

In addition to direct involvement in land application of sludge research, members of the W-170 committee have participated in sludge related activities sponsored by other agencies. Examples follow:

-1976 CAST (Council for Agricultural Science and Technology) workshop, "Application of Sewage Sludge to Cropland: Appraisal of Potential Hazards of Heavy Metals to Plants and Animals". CAST Rep. No. 64.

-1980 CAST workshop, "Effects of Sewage Sludge on Cd and Zn Content of Crops". CAST Rep. No. 83.

-1987 EPA Science Advisory Board. Review of Technical Documents. Supporting Proposed Revisions to EPA Regulations for the Disposal/Reuse of Sewage Sludge under Sec. 405(d) of the Clean Water Act.

-1988 Contributing authors and technical reviewers of "U.S. EPA Guidance for Writing Case-by-Case Permit Requirements for Municipal Sewage Sludge". Draft, September 1988.

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SUMMARY

The PRC approached the review of the proposed rule by addressing specific components of the rule, questions raised by the Agency in the preamble, and the methodologies and technical databases given in the Technical Support Document (TSD).

At times in this review reference is made to the TSD upon which the rule is based. These TSDs are referenced in the Preamble of the proposed rule and are available through the EPA library in Washington, D.C.

The PRC attempted to be as comprehensive as possible in its review, but because of time limitations and the mix of technical expertise on the committee, we were unable to address all aspects of the rule. The PRC has drawn specific conclusions regarding the technical merits of the rule and its underlying assumptions, methodologies and databases, and has made specific recommendations to EPA for revision of the rule. We did not completely review and correct the TSDs. However, we found such extensive misinterpretation and errors in the TSDs that it is imperative that EPA review and revise them completely. We also recommend that review and revision of the rule and the TSDs be conducted in consultation with the PRC and other knowledgeable experts.

Benefical Use of Sewage Sludge

Based on our knowledge of, and experience with, research results on sludge utilization in agriculture, the PRC strongly supports EPA's policy of beneficial use of sewage sludge. Also the committee is pleased to learn that "Prior to finalizing the rule, the Agency will carefully consider, and place heavy emphasis on, those comments and approaches that support the Agency's policy of beneficial reuse." If the Agency adheres to these policies, beneficial use should be achieved to the maximum extent possible.

EPA states that "the Agency's preference is for local communities to beneficially use their sewage sludge". However, the proposed rule is based on a series of worst case scenarios, which are so stringent and inflexible that local communities are precluded from beneficial use options considered protective of the public health and the environment under local conditions. Beneficial use is constrained because the proposed rule provides no allowances for local conditions within and among communities. The PRC is concerned that, in spite of the Agency's own findings that the aggregate risk for the land-based sludge utilization options are lower than that associated with other disposal options, the proposed regulations encourage non-utilization practices.

Separation of Science and Policy

It is evident from a review of the document that many of the conclusions reached by EPA are not driven by science, but rather by policy decisions. In view of the inherent uncertainties in risk assessment and the necessity for value judgements, the prominence of policy decisions is understandable. However, instead of acknowledging these policy decisions and justifying them on legal, political and social grounds, EPA has, in many cases, tried to make it appear that the basis for these decisions was scientific. This problem permeates the proposed rule and technical support documents.

Again, with no desire to appear repetitive, we wish to emphasize that EPA has disguised policy decisions with the risk assessment assumptions and database, apparently to make it appear that the results were derived scientifically. Had they wished to do the effort correctly they should have, at the very least, clearly presented the underlying assumptions, data and models. Instead, these are scattered through numerous documents in a manner that is very difficult to access.

Another example of the attempt to gloss over uncertainties and to give an appearance of accuracy is a persistent use of more significant figures than can be justified. This problem leads to such absurdities as the use of 3.84×10^{-2} kg/ha as the maximum annual application rate for hexachlorobenzene when all the concentrations for such organics in the 40 City Survey were below the detection limit. Another example of this problem is the use of numbers such as 5976 for the baseline of lead risk in the case of incineration. The use of such numbers is dangerous in that it can give the impression that differences such as 5155 for Options II and III (see Table E of the Abt document (1989) and 5163 for Option III are meaningful. The uncertainties involved in the calculation are not only larger than the difference, but are likely to be larger than the difference between the highest value of 5976 and the lowest value of 4759 in the calculations. The same is certainly true for the differences in the annual cancer cases in the non-incineration options and probably true for all of the cases including incineration. Indeed, the extreme conservatism used, beginning with the plausible upper-bound nature of the carcinogen potency factors, means that there is no significant difference between the cancer cases calculated for incineration (about 12) and zero.

Aggregate Human Health Effects

The Agency has estimated aggregate human health effects for sewage sludge applied to agricultural lands and non-agricultural lands, distributed and marketed, placed in monofills, and incinerated. In the case of the aggregate effects analysis, the Agency used the common practice of upper-bound estimates of carcinogenicity. This makes the resulting postulated aggregate cancer cases likely upper-bound estimates. Even using this approach, the Agency determined the aggregate risk for all beneficial land effects-based options to be insignificant. In fact, by their own admission, "The actual incidence may be substantially less than predicted here and, in fact, may be zero" (p. 5779 proposed rule).

Appropriateness of the Exposure Assessment Models

The exposure models used by EPA to assess MEI sludge risks have five basic components: selection of appropriate environmental exposure pathways, selection of appropriate most-exposed individual (MEI) for each pathway, selection of appropriate contaminant transport models, screening and selection of appropriate data for each contaminant and pathway, and selection of an allowable risk. There appear to be serious deficiencies in all of these components with the exception of pathway selection. The latter is appropriate for the disposal options considered.

The proposed Rule and supporting analyses, in many cases, have not provided the data generally considered necessary for the presentation of risk assessment results. At a minimum, the assumptions applied and the reasons for their selection should be clearly presented, with the associated uncertainties and their potential effect on risk considered.

For example, in its exposure assessments for the various pathways evaluated, the basis for the assumptions applied were often not clearly presented, and the methodologies for estimating the magnitude of exposures and the size of the populations exposed, were not always clearly provided. In its most complete form, an exposure assessment should describe the magnitude, duration, schedule and route of exposure; the size, nature and classes of the human populations exposed; and the uncertainties in all estimates. This information was often not clearly provided, or was provided inconsistently from pathway to pathway evaluated.

Most exposed individual (MEI)

Critical to the risk assessment models is identification of an MEI, who becomes the driving force of criteria setting. The MEI does not describe the total distribution of exposures and risks, even though such information is essential to predicting the range of risks of a disposal option. The exposures implied by the MEIs are grossly exaggerated, and it is impossible to know the probability that such an MEI exists. Because the assumptions underlying selection of the various MEIs differ, the extent of conservatism embodied in the various MEI exposure models also differs. Further, insufficient information is available to compare the relative degree of conservatism of one MEI with another. Consequently, it can be misleading to compare risks derived from one MEI with another because different premises were used within and among disposal options. The reliance on "worst-case" scenarios pervades these documents and needs to be reconsidered. The MEI is so rigidly defined that it completely overshadows other components of the risk assessment pathways, and even to the extent that it makes the issue of "inappropriate" technical data almost irrelevant.

The fundamental problem (mentioned repeatedly in this review) is that EPA attempts to define risk value by a layering of worst case assumptions. As a result, what is finally arrived at is unknown and unknowable. When worst case assumptions are made, do they lead to the 95th percentile, the 99th percentile, the 99.99999th percentile or what? At a certain point, which is a function of the size of the exposed population and other variables, there is a percentile which is ridiculous and not even defined because there are no individuals in the group (e.g., the 99.99 percentile of 100 people).

In our judgement, the definition of the "most exposed individual" used by the Agency is not consistent with the Agency's intent to protect the public health and the environment from reasonably anticipated adverse effects associated with potential sewage sludge exposure. The scenario of exposure assessed for the MEI is unreasonable (overly conservative) for the vast majority of individuals in the general population, and substantially overestimates actual exposure for the sector(s) of the population with the highest potential exposures from sewage sludge.

Model selection

The models selected to simulate contaminant transport in surface runoff and landfill leachate were either overly simplistic (e.g., use of the USLE for runoff and erosion) or inappropriate (e.g., use of the CHAIN model for unsaturated flow landfill leachate). There was also poor documentation and use of the unvalidated saturated flow model, AT123D.

Screening and selection of data

A major flaw of the exposure assessment was the inappropriate and scientifically unsound approach used to select data for individual contaminants and pathways. Rather than accepting the existence of no-observed-adverse-effect data from valid field studies with sludge, data from pot studies or those with metal salts were selected if they were the only ones to show an effect. Researchers have emphasized on several occasions (Logan and Chaney, 1983; Page et al., 1987) that data from pot and metal salt experiments should not be extrapolated to results found in the field with sludge. This approach of data selection, for instance, led EPA to conclude that sludge-borne Cu, Ni and Zn would cause phytotoxicity in crops, a situation never observed in the field.

Definition of Sewage Sludge

The proposed rule includes sewage sludge products no matter how small the percentage of sewage sludge in the product or its quality to be regulated under the proposed rule as sewage sludge. This is counter productive to the Agency's stated policy of benefical reuse. The proposed definition unfairly stigmatizes blended sewage sludge products, particularly those which contain only small percentages of sewage sludge, or "clean" sludge. This definition will discourage the development of privatization programs designed to utilize the uniquely high organic content of sewage sludge in the preparation of customized fertilizer blends.

We urge the Agency to develop the concept of a "clean sludge", i.e., a sludge that meets all criteria for unrestricted utilization. The Agency should exclude from regulation all products containing "clean" sludge.

98th Percentile Sludge Constituent Analysis

We question use of the 98th percentile constituent analysis from the "40 City Study" to regulate sludge disposal on non-agricultural land. The Agency elected to use risk assessment analysis to develop standards for the disposal of sewage sludge. The results of this aggregate risk analysis showed no significant health or environmental constraints. Therefore, development of regulations for non-agricultural use based upon sludge constituent distribution (98th percentile) has no place in the proposed rule. Results of the on-going sludge quality study by EPA will not improve this approach.

The PRC fears that in spite of these "no-adverse-effects" findings, the Agency will promulgate regulations that discourage sludge reuse in low-risk, land-based options in favor of higher risk disposal by non-beneficial practices.

Distribution and Marketing

The PRC finds that the approach used by EPA in setting rules for D&M are unacceptable. Concerns include assumptions about loading rates, D&M MEIs, and the lack of a clear definition of D&M products. Errors in risk analysis for sludge constituents are so extensive and severe that the Agency needs to rewrite this section of the rule after re-evaluation of risks from sludge constituents using correct data.

Assumptions on Soil Background Levels

The risk assessment methodology assumes that the background level of organics in soils is zero, and that the background level of trace metals is that of uncontaminated soil. For many organics, particularly the chlorinated insecticides, i.e., dieldrin, chlordane and DDT, background levels in agricultural and even urban soils may approach those found in sewage sludges. Likewise, background levels of several of the trace elements, notably lead in urban soils, can be significantly higher than those for uncontaminated soil and present in many sludges. The Agency should utilize available data on background levels of these compounds.

Phytotoxicity

Based on: (1) evidence that phytotoxicity does not impact human health, (2) evidence that, even at very high application rates (>500 mt/ha), phytotoxicity rarely if ever occurs where municipal sludges have been used in field agricultural operations, and (3) the fact that if phytotoxicity occurs, it is easily corrected, the PRC rejects EPA's decision in the proposed rule to allow the issue of phytotoxicity (based upon worst-case scenarios and incorrect or incorrectly interpreted data) to essentially prohibit beneficial use of sewage sludge.

Sludge Application Rates

In Sections 503.12, p. 5799; 503.14, p. 5803; and 503.14, p.5880, the proposed rule limits sludge application to agricultural lands to a maximum of 50 metric tons per hectare on a dry weight basis. It is not clear if this is an annual or cumulative rate of application. This limitation is based on the inability of the exposure assessment model to calculate pollutant limits above a 50 metric tons per hectare sludge rate and a belief by the Agency that land application at greater rates constitutes disposal rather than reuse. Only in the latter section (503.14, p. 5880) is the rate specified as an annual loading rate. If it is a cumulative rate in the other cases, agricultural utilization is limited without scientific basis. In fact, much greater rates have been utilized safely. Even if it is considered an annual limit, composted or lime-treated sewage sludges may have to be applied at rates greater than 50 metric tons per hectare for utilization at nitrogen fertilizer rates. Thus the only apparent rationale for the 50 metric ton per hectare rate is the inability of the Agency's exposure assessment model to calculate pollutant limits above the 50 metric tons for hectare rate. This being the case, the model should be corrected and annual application rates should be limited by the fertilizer value, and cumulative rates by pollutant limits. It is not clear why total sludge loading is limited to 50 metric tons per hectare because of model constraints, when in fact cumulative metal loadings are computed without a sludge loading limitation.

Management Practices

The PRC strongly recommends EPA allow for exceptions to all of the management practices on a case-by-case basis. It concludes that EPA should clearly state its assumptions on use of management practices as part of the regulations, and these assumptions should reflect the experimental conditions of the scientific data they utilize to develop their risk assessment. Further, a management practice should be permitted if site-specific considerations can be shown by the risk assessment calculation not to exceed EPA risk limits.

Pathogens

The PRC concludes there is no compelling risk assessment analysis to justify the scheme of classifying and regulating pathogen content of sludge in the proposed rule.

Analytical Detection Limits

The PRC concludes that, by lack of statements to the contrary, EPA has taken the position that, when sludge analytical data is reported as less than the detection limit, the reported limit of detection will be used to determine regulatory compliance. Because analytical methods and limits of detection for sludge constituents can vary widely, and because the Agency has established no mechanism for certifying sludge analytical methods, this position is unworkable. Certifiable analytical methods with appropriate limits of detection need to be established by EPA for all regulated pollutants in sludge. This is particularly important for the organics. Beyond this, the Agency needs to consider how to use data reported as less than the detection limit for regulatory sludge pollutants.

Dedicated Sites

The proposed rule assumes that local governmental utilities (POTWs) do not now own, nor are they interested in long term ownership of land application sites. This assumption is false. Many POTW entities, such as those in Seattle, WA., Sacramento, CA, Chicago, IL and Danville, IL already have acquired thousands of acres of land for long-term use as non-agricultural land application sites. This practice was encouraged under 40 CFR 257 as dedicated land application. It is unclear whether the proposed rule even recognizes this classification. In the absence of a clear recognition of this classification, the proposed rules pose many troubling problems for local governments such as:

1. The status of continued use of such lands
2. The status of current ownership
3. Transferability of ownership
4. The ability to convert dedicated land application sites to other uses.

Past experiences with local government ownership of dedicated land application sites suggest that this is a preferred mode of operation in many instances. Reasons may include local politics, public relations, and liability.

The proposed rule should offer clear directions on this issue to assist units of local government in their long term planning for beneficial use of sewage sludge.

RECOMMENDATIONS

The PRC recommends, at a minimum, that EPA revise and repropose the 503 regulations to correct their risk assessment methodology to consider different MEIs, models, clean sludge, site-specific considerations and data inputs, etc.. Specifically, EPA should:

- Revise the proposed rule to conform to their stated policy to encourage the beneficial use of municipal sewage sludge.
- Enlist working groups consisting of sludge experts, risk experts and modelling experts to review the data, revise the scenarios and obtain more realistic estimates of pollutant limits.
- Use risk assessment procedures which lead to best estimates and uncertainty bounds rather than calculating upper bound estimates. At a minimum, the MEI should be replaced with an approach which considers an exposure unit that is reasonably calculable.
- Use biokinetic models to obtain realistic estimates of absorption, translocation and excretion of pollutants.
- Use realistic dietary scenarios in calculating food chain inputs of pollutants to humans.
- Use sensitivity analysis to identify the most critical parameters in risk/exposure computation and make efforts to obtain reliable and realistic estimates for these parameters.
- Adhere to normal scientific practices in the use of the number of significant figures.
- Use field studies with municipal sludge instead of non-field studies with metal salts or pure organic compounds.
- Use field data to establish Lowest Observable Adverse Effect Levels (LOAELs) or No Observable Adverse Effect Levels (NOAELs) as a basis for calculating limits on pollutants.
- Expand the proposed rule to include consideration of potential Fe and F toxicity.
- Develop the concept of a "clean sludge" which allows minimal regulation.
- Not regulate all D&M products as sludge.
- Require labelling of D&M products to provide consumer information on proper use of the product.

- Drop MEI scenario for D&M that assumes a rural nonfarm family grows 60% of their fruit and vegetables in a D&M sludge-amended home garden.

- Prepare and address different categories for nonagricultural and D&M practices.

- Exempt from the rule banned compounds that have been shown to pose insignificant risk (such as lindane, chlordane, PCBs, hexachlorobutadiene). This action would be consistent with the screening approach used by EPA (i.e., Environmental Profile and Hazard Indices) to eliminate low priority pollutants from consideration.

- Develop more realistic data bases, assumptions and risk exposure models consistent with results from field studies using sludge applied PCB, and perform detailed re-evaluation and analyses of the PCB pathways.

- Use two distinct frameworks to assess risk for nonagricultural land:
  a) exposure and significant future conversion very low,
  b) exposure more likely or conversion more probable.

- Allow for exception to the five-year conversion period in nonagricultural land application on a case-by-case basis.

- Reject 98th percentile concept.

- Continue their approach of separating the vector attraction reduction requirements from the pathogen reduction requirements in the proposed regulations.

- Regulate pathogens on a risk based approach. In the interim the existing procedure in 40 CFR 257 should be maintained.

- Replace the air dispersion model in SLAPMAN and SLUDGEMAN with a more realistic model, such as that used for the EPA incineration program.

- Adopt a consistent approach for including volatile compounds (e.g.,benzene and trichloroethylene) in models used to predict air and groundwater transport.

- Exclude from the rule the chemicals which the Agency assumes to be lost from the sludge during processing and are not present in the sludge in significant amounts.

- Discontinue use of the CHAIN model in SLAPMAN and SLUDGEMAN to model contaminant transport in the unsaturated zone and replace with a more appropriate model, such as PRZM, RUSTIC or LEACHM.

- Perform conversion of output from the unsaturated zone transport model to input for the AT123D saturated zone transport model in such a way as to satisfy conservation of mass.
- Use realistic, site-specific geologic, hydraulic and chemical parameters as input to computer simulations of contaminant transport.
- Differentiate between trench and area monofills because of the potential for leaching from these types of monofills.
- Modify the proposed definition of surface disposal to reflect the operational difference between storage with no intent for further management, and storage as an essential component in an overall sludge management scheme.
- Not require methane monitoring at surface disposal sites.
- Establish acceptable analytical methodologies and limits of detection for regulated sludge pollutants.
- Define the limit of detection (LOD) as the lowest concentration that can be determined to be significantly different from a blank for an analytical test method and sample matrix.
- Replace the sum of individual limits of detection for multiple pollutant categories (e.g., PCBs) with the highest level of detection for any individual parameter in the multiple parameter set.
- Develop a consistent method to use data that is reported as less than the limit of detection.
- Consider a POTW reporting a limit of detection less than or equal to the acceptable limit of detection to be in compliance with any EPA concentration-based regulatory limit derived from that limit of detection.
- Allow the use of zero concentrations from sludge pollutant data below the limit of detection for laboratories meeting the Agency's analytical standards.

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RISK ASSESSMENT METHODOLOGY

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SUMMARY

While we commend EPA for using a multimedia, risk assessment approach for developing the rule, we believe the effort has been severely compromised by a piece-meal, policy-driven effort. The use of upper bounds and worst case estimates is not new. But, usually there are not multiple layers of conservative assumptions as there are in the development of the presently proposed rule. We believe that this situation is a striking example of the need to attempt best estimates and uncertainty calculations. There is no question that this is a more difficult approach. It is certainly easier to develop a scenario so bizarre that no person will ever have that much exposure and then to protect that nonexistent person and thereby all existing persons. But, as pointed out numerous times in this review, that approach leads to results that can not only be unrealistic, but where the degree of unreality can not even be estimated. The regulation of sludge disposal options based on multi-media risk assessments should not be driven by these bizarre scenarios.

We believe that the aggregate risk analysis is reasonable with regard to the relative impacts of the technologies. However, any reasonable analysis of the uncertainties in these calculations make the cost/benefit analysis questionable.

We realize that EPA is under time pressures from the courts and that limited options are available regarding the proposed Rule. The best of all choices would be to put together a task force including risk and sludge experts that could develop consistent and realistic values using best estimates and uncertainties to arrive at exposure numbers representing some appropriate percentile of the exposed population. If one group were to develop the framework this would also help with some of the problems involving inconsistencies between different disposal options. While such an effort would not be trivial, it would not require going back to ground zero. Many of the calculational aspects are in place and simply need to be rerun with more appropriate numbers.

Another choice, recognizing the time constraints, is to make the best use of the proposed regulatory approach, based on the MEI calculational algorithms. In this case, we recommend using the data and calculational corrections mentioned in this report plus a modified approach to establishing a "more reasonable MEI". This approach would replace the "most exposed individual" with a Reasonably Calculable Exposed Unit (RCEU). The RCEU would use explicit safety factors, defined in a policy statement, to account for extremes. The RCEUs would be formulated by an interdisciplinary committee including sludge technology, environmental, health, and risk experts along with EPA, contractor and NRDC staff. The specific steps in this approach are as follows:

1) List the basic methodology assumptions and data inputs for the calculational algorithm for each disposal technology,

2) Convene a working group for each technology. The working group will include a modeler, sludge technologists, and risk experts using the best judgement of the group to reach a set of appropriate assumptions, models and data sets. The methodology and data base for each technology will be reviewed for consistency among the technologies. A main focus of the group will be to establish RCEUs to replace the MEIs.

3) The RCEUs for each technology will be reviewed for consistency among the technologies. The RCEUs will be used to generate the disposal option limits for the Rule.

4) The RCEU algorithms will be applied to several sites to test the impact on the disposal technology. The impact on "well managed" technology as well as a hypothetical poorly managed technology will be calculated to observe the ability to achieve risk management objectives. If time permits, the aggregate risk impacts of the Rules for these examples could be estimated. As necessary, the RCEUs will be modified to reflect desired risk management objectives. This step will include the addition and/or modification of policy decisions (e.g., safety factors) for the RCEUs.

5) The ability of sludge practices to deviate from the RCEU algorithms based on a site-dependent risk assessment resulting in de minimus risks will be established. This will allow "good practices" that may be unfairly impacted by the RCEU to continue their practice by demonstration of insignificant risk.

6) The RCEU algorithms will allow to update and/or modification based on new models and data, as appropriate.

As the least attractive option, it is possible to patch up the documents and the rule in a piecemeal fashion, but this would not help with the lack of consistency between options and other problems. It would not be a very satisfactory approach. Nevertheless, we have made several specific suggestions concerning various issues, and many of these do not involve great efforts to correct.

INTRODUCTION

The charge to the group was to review the methodologies and details of the risk assessments performed by EPA in preparing the proposed rule for sewage sludge disposal. Unfortunately, the group only had access to the rule itself in advance of the meeting. At the meeting and shortly following the meeting, several other documents were obtained. The most important of these were the Technical Support Documents, the Science Advisory Board (SAB) Review, the document by Abt (1989) describing the aggregate risk assessment and documents describing the 40 City Survey. Also, during the meeting in Washington, D.C., the subgroup was fortunate in receiving an informative briefing on the aggregate risk analysis from representatives of Abt and EPA.

Because of the relatively limited time available to the Risk Assessment subgroup, this review will focus mostly on the deficiencies in methodology and philosophy of EPA's approach rather than on specifics. Where we do become specific it will generally be to give an example of methodological deficiencies.

We recognize that the EPA has put a great deal of effort and resources into these documents. Some, indeed many, of our concerns were raised by the SAB. EPA gave consideration to some of the SAB comments, but decided not to change their analysis in many cases. We feel that in many cases the SAB comments should have been taken more seriously. Thus, if some of our comments seem repetitious and/or already addressed by the SAB, it is because we, like the SAB, feel that there are deficiencies yet to be corrected. At the same time, we recognize that EPA was operating under severe time constraints that limited the ability to do a rigorous analysis.

BACKGROUND AND OVERVIEW

The EPA Approach

EPA is "proposing regulations to protect public health and the environment from any reasonable anticipated adverse effects of certain pollutants which may be present in sewage".

EPA is constrained by certain Acts and Court decisions in its approaches. These include the Vinyl Chloride decision in which the court ruled that under the Clean Air Act the Agency must use a two step process in making regulatory decisions for air emission standards. The first step is to define an acceptable risk based on health factors alone. The second step is to define a regulatory limit in which the Agency may consider non-health related issues, such as cost, as long as the limit does not exceed the acceptable level of risk. Various other acts such as TSCA, RCRA and CERCLA address the issue of acceptable risk and establish excess lifetime cancer risk levels in the general range of 10^{-4} to 10^{-6}. EPA considered various approaches and adopted the one that involves the use of a mixture of methods involving the most-exposed-individual (MEI) risk, the 98th percentile pollutant concentrations in sludge and aggregate risk.

In general, the driving factors in their analysis are the MEIs. An MEI can be human, plant or animal. This is essentially a model that is supposed to represent a living organism that, because of individual circumstances, has the maximum exposure to a given pollutant for a particular disposal practice. While this concept seems simple, it presents severe methodological problems to a risk assessment. Risk assessment is fundamentally a probabilistic analysis dealing with a random variable. It is possible to discuss the upper 99th percentile (or 90th or 95th), but the individual with the greatest exposure is a concept without statistical relevance. EPA can improve the MEI approach by attempting to define the risk value that corresponds to a very small, but statistically meaningful, percentage of the population.

The MEI approach also presents a potential conflict with the basic aim of the proposed Rules to protect public health and the environment from any reasonably anticipated adverse effects. Sludge will be generated, and all the disposal options have risks. (There is no zero risk option.) These options should not be constrained based on MEI algorithms to disposal practices that result in increased aggregate population risks. The MEI is the result of specific scenarios that include appropriate exposure pathways. The MEI concept is difficult to correlate to aggregate risks for the different practices. The extreme nature of the current MEI makes it inappropriate to create algorithms to "protect" the MEI. The disagreement over the extreme nature of the MEI and the level MEI risk can be moot because of lack of correlation to the relevant public health and environmental risk. A reasonable alternative approach to the MEI is to look at "high percentile" fractions of exposure groups.

The fundamental problem (mentioned repeatedly in this review) is that EPA attempts to define this risk value by a layering of worst case assumptions. As a result, what is finally arrived at is unknown and unknowable. When worst case assumptions are made, do they lead to the 95th percentile, the 99th percentile, the 99.99999th percentile or what? At a certain point, which is a function of the size of the exposed population and other variables, there is a percentile which is ridiculous and not even defined because there are no individuals in the group (e.g., the 99.99 percentile of 100 people).

Definitions and Risk Assessment

There has been difficulty in defining risk (Gratt, 1989a). The definition we will use is:

> Risk is the potential for realization of unwanted, adverse consequences to human life, health, property, or the environment; estimation of risk is usually based on the expected value of the conditional probability of the event occurring times the expected consequence of the event given that it has occurred.

Thus, risk is a random variable with a corresponding distribution function which implies an uncertainty associated with the risk.

Uncertainty in risk assessments is usually considered near the end of the analysis, if at all. Uncertainty analysis as used herein refers to methods by which the inexactness of the knowledge and description of events and processes can be translated into probabilistic statements about the resulting consequences. Sensitivity refers to the impact of a change in a given value on the overall risk assessment result (such as a partial derivative).

A risk assessment usually involves the estimation of components of the risk. In many cases, assumptions must be made to quantify a risk estimate. The components are often based on assumptions that differ in degree of conservatism. The use of "conservative bounding estimates" for some of the risk components and "best estimates" (most probable, average, etc.) for others severely complicates the understanding of the uncertainty of the final risk estimate. Unfortunately, many risk analysis processes use risk estimates from several different sources and management quickly becomes confused by the enormous range of risks. Furthermore, because inconsistent assumptions are applied, it is impossible to make reasonable comparisons between different options (although this is not always recognized). As a result, regulators and policy makers will often select extremes in the name of conservatism. But, they have no idea of the degree (i.e., the event probability) of extremeness represented by the final result.

In the context of the EPA analysis, the definition of the MEI specifies an extreme event. For example, a person staying on the edge of a monofill for 70 years, with the wind always in the same direction, etc. These events have associated with them certain probabilities. Given that the event occurs, there is some consequence (e.g. a 10^{-4} chance of cancer).

Having made these definitions, we can point out what we believe is the fundamental problem with the MEI analysis as it presently stands. Traditionally, risk assessment has dealt with two extreme ends of the risk scale. One is the low probability-high consequence risk (e.g., nuclear reactor meltdown). The other is the high probability-low consequence risk (e.g., car accidents). The EPA approach is yet another extreme, namely a low probability-low consequence risk. That is, the probability that an MEI as defined actually exists is certainly very small, and in many cases zero, and the health consequence, given that this hypothetical person does exist, is 10^{-4}, or less. We believe that this problem has arisen because of a confusion of policy and science.

Policy Versus Science

The effort by EPA has clearly been driven by policy decisions rather than science. In view of the inherent uncertainties in risk assessment and the necessity for value judgements, the prominence of policy decisions is understandable. However, instead of acknowledging these policy decisions and justifying them on legal, political and social grounds, EPA has, in many cases, tried to make it appear that the basis for decisions was scientific. This problem permeates the entire effort. For example, on pages 6-3 to 6-5 of the Technical Support Document on Incineration, EPA "derived" a value for the percentage of total chromium which is hexavalent (the carcinogenic form) by averaging data from tests on two sludge incinerators. One test found Cr^{+6} at less than the detection limit of 10 mg/kg. The other test yielded a value of 130,000 mg/kg. A difference of at least four orders of magnitude! EPA assumed the lower value was the detection limit, calculated the geometric mean of 10 mg/kg and 130,000 mg/kg and multiplied by an uncertainty factor of 10 to give a value of 1% that was used to calculate the cancer risk. There is no scientific basis for this approach, but it looks scientific! It appears that for some reason EPA decided that 1% was a reasonable number and simply tried to find a way to generate it.

Another example of the attempt to gloss over uncertainties and to give an appearance of accuracy is a persistent use of more significant figures than can be justified. This problem leads to such absurdities as the use of 3.84×10^{-2} kg/ha as the maximum annual application rate for hexachlorobenzene when all the concentrations for such organics in the 40 City Survey were below the detection limit. Another example of this problem is the use of numbers such as 5976 for the baseline of lead risk in the case of incineration. The use of such numbers is dangerous in that it can give the impression that differences such as 5155 for Options II and III (see Table E of the Abt document (1989) and 5163 for Option III are meaningful. The uncertainties involved in the calculation are not only larger than the difference, but are likely to be larger than the difference between the highest value of 5976 and the lowest value of 4759 in the calculations. The same is certainly true for the differences in the annual cancer cases in the non-incineration options and probably true for all of the cases including incineration. Indeed, the extreme conservatism used, beginning with the plausible upper-bound nature of the carcinogen potency factors, means that there is no significant difference between the cancer cases calculated for incineration (about 12) and zero.

Part of the problem mentioned above arises from a failure to attempt a best estimate and a calculation of uncertainties. We feel this was a mistake. EPA did do some sensitivity analyses for certain parameters such as the distance to aquifers and the stack height of incinerators. These calculations showed that in some cases the risk was 2 or 3 orders of magnitude less than the default value used. Similarly, in view of the extraordinary values allowed for lindane, it would appear possible to have a sludge that is 100% lindane presenting little or no risk. Furthermore, these "uncertainties" do not include a consideration of the uncertainties involved in the cancer potency factors which are known to be as much as six orders of magnitude (Cothern et al., 1986).

The uncertainties in the calculations are of particular concern when evaluating the significance of the costs and benefits estimated in Table XI-1 in the proposed Rules. For example, the estimated human health benefits for land application are 0.06 cancer cases avoided and a reduction of approximately 20 lead cases. Any reasonable evaluation of uncertainties would lead to the conclusion that the uncertainties are much larger than the calculated benefits.

Again, with some fear of appearing repetitive, we wish to emphasize that EPA has disguised policy decisions with the risk assessment assumptions and database, apparently to make it appear that the results were derived scientifically. Had they wished to do the effort correctly they should have, at the very least, clearly presented the underlying assumptions, data and models. Instead, these are scattered among numerous documents in a manner that is very difficult to access.

The apparent policy decisions that emerge are that incineration is not a favored option because it potentially exposes larger numbers of people leading to greater aggregate risk and that monofills are not favored because of the potential for high exposure to a few individuals. These considerations resulted from the application of a 10^{-5} lifetime risk for incinerators and an unreasonable MEI for monofills. But when the proposed rules are applied, inconsistencies inevitably result and the risks of the various options can not be fairly compared with one another. EPA states that it prefers beneficial use to incineration and yet the result may be to drive some municipalities toward incineration because of the apparent technical fix (i.e. electrostatic precipitator control technology) and the severe restrictions for land application. EPA's failure to include ash disposal and fly ash deposition risks of incineration (e.g., oxidation of Cr compounds, dioxin formation, and soluble As and Se) in the risk assessment will further contribute to this possibility.

Improvements

Instead of attempting to force numbers to justify policy decisions, EPA should be straightforward and clearly state policy decisions as they occur in the process. If, on the other hand, legal aspects require a risk-based approach, then EPA needs to do the assessment correctly, which means the assessment has to be scientifically based and complete.

The overall risk methodology that looks at the aggregate risks (Abt, 1989) indicates that incineration is the least preferred option compared to all land disposal options if one compares the results for lead. The reviewers believe that these results would be consistent for the other sludge constituents. These aggregate results are not, however, used in the application of the rules to determine the sludge management practices. Instead, policy decisions have been used, with apparent inconsistencies, to establish algorithms for disposal practices based on the MEI It is apparent that the analysis methodology for the aggregate risks could be applied at each site to determine disposal practices allowed under a revised set of rules. Although this would entail a larger effort for EPA initially, the result would be more appropriate to achieve the desired results.

The proper application of risk assessment techniques should include the attempt to get a "best estimate" and the associated uncertainty band about this point estimate. Policy decisions can then be made to set a given degree of protection for a level of confidence or specific percentile. The selection of upper bounds leads to very improbable results where the application of the rules are driven by pure policy decisions in selecting the degree of conservatism versus trying to obtain a true understanding of the risk. The risk of the MEI is not meaningful if it is for a vanishingly small fraction of persons. The nature of risk assessment in using probabilistic models means the population at risk and pollutants of concern for the critical pathways must be properly defined. This is equivalent to obtaining the proper sample space in probability theory. The population at risk is the entire US population. The pollutants must be considered with conservation of mass and properly tracked in the environment including their pathways to target organisms. The results can use intermediate distributions (as opposed to single point estimates as an upper bound or worst case values) to represent possible outcomes. These distributions can be used to estimate the final distributions of the risk for each option. The appropriate policy decision can then be made based on the aggregate risks for the different disposal options. The policy decisions can now be reduced to algorithms for risk management and incorporation into the Rules. The critical factors for each decision, along with the potential need for research to resolve important uncertainties can also be identified for future modifications of the rules.

Because of the shortness of time involved in this review, we could not fully develop examples or alternative calculations to illustrate how to calculate uncertainties and estimate distributions. A brief example is given later. A general description of the process is given Gratt (1989b), and an example for an entire industry (oil shale) is given in Gratt et al. (1984).

We note that there has been a recent effort at EPA to do some of the analyses we are recommending. We have had a short time to review a July, 1988 draft report entitled "Feasibility of a Novel Approach Using Most Exposed Populations (MEP) as a Basis for Assessing and Comparing Risks of Sewage Sludge Disposal Options." While we are not in agreement with all of the methods being examined, we do think this effort is commendable and should have been an early step instead of an afterthought. At various points in this report, we illustrate ways in which we believe uncertainty could have been estimated. One example is given below.

The MEI for Land Application (Agricultural) Pathways 1, 3 and 4 analyses is an example of the problem of piling conservative assumption on top of conservative assumption. While one might argue that there are people who receive 2.5% of plant groups grown on sludge-amended land, etc., it is impossible for such a person to have the highest consumption of all the key food groups for 70 years from birth to death. Nor is it necessary to do so. Various food consumption surveys give data on consumption by age, sex, income, geographical region and other variables (Pennington, 1983). There is no need to take such a simplistic and erroneous approach.

Food consumption data can be used to choose variables such as income which maximize intake but at the same time use a food intake appropriate to the age and sex of the individual (Tsongas et al., 1980; Pennington, 1983). This approach could then lead to a best estimate and an uncertainty range. An additional discussion of dietary intake is given by the Land Application Workgroup.

The choice of 2.5% of plants from sludge-amended soils was, of course, arbitrary. It simply represents 100 times the average value. Whether that value is realistic or not, is virtually impossible to verify. But no one is going to (nor would want to) eat the diet of a 20 year old for 70 years.

REVIEW OF RISK ASSESSMENT

Approach and Presentation

EPA's proposed Rule aim to protect public health and the environment from any reasonably anticipated adverse effects of certain pollutants which may be present in sewage sludge. Heavy emphasis was placed upon the application of risk assessment methodologies. In developing its proposed limits, EPA made numerous decisions related to ultimate risk determinations including: Selection of pollutants to be evaluated; determination of which media (air, water, soil) transport the pollutants from sewage sludge into and through the environment; selection of target organisms (i.e., individuals or groups of humans, plants or animals) most likely to be effected by exposures to sludge; selection of mathematical models to simulate the movement of sludge components into the environment and ultimately to selected target organisms; definition of an effect of concern; and judgements about levels of risk that are adequate to protect human health and the environment.

In reviewing the approach that EPA has taken in this proposal, one could question almost any of the hundreds of data points and assumptions that have been applied and evaluate the strength of the scientific data upon which they are based. Indeed, this is done in the other sections of this report. The approach of the Risk Assessment Workgroup to this review, however, has been to focus on the major areas and assumptions that appear to drive the ultimate risk-associated decisions, and to de-emphasize in-depth evaluation of those for which the approach is consistent with general EPA and U.S. regulatory agency policy.

The proposed rule has been primarily based on the application of risk assessment methodologies to determine acceptable concentrations of pollutants to protect public health and the environment from any "reasonably anticipated adverse effects."

The proposed rule and supporting analyses, in many cases, have not provided the data generally considered necessary for the presentation of risk assessment results. At a minimum, the assumptions applied and the reasons for their selection should be clearly presented, with the associated uncertainties and their potential effect on risk considered.

For example, in its exposure assessments for the various pathways evaluated, the basis for the assumptions applied were often not clearly presented, and the methodologies for estimating the magnitude of exposures and the size of the populations exposed, were not always clearly provided. In its most complete form, an exposure assessment should describe the magnitude, duration, schedule and route of exposure; the size, nature and classes of the human populations exposed; and the uncertainties in all estimates. This information was often not clearly provided, or was provided inconsistently from pathway to pathway evaluated.

In estimating exposures, the risk assessor generally has several options available that will yield more or less conservative estimates of exposure. Among the options are different assumptions about the frequency and duration of exposure, rates of intake or contact, and rates of absorption or uptake. The reason for the selection of a particular option was not always provided and its effect on risk and ultimate allowable concentration not clearly presented.

In its presentation of ultimate risk information, the proposed Rule often did not provide the appropriate units necessary to fully characterize risk. For example, risk levels are presented as "$1x10^{-4}$" without an indication of whether this applies to a lifetime or to an annual risk. Such units should be more clearly presented in the final document.

A convenient way to present the major risk assessment- related issues is to divide them into the appropriate category of the 4-step risk assessment process, as defined by the National Academy of Sciences (1983):

1. Hazard Identification: The evaluation of the data on the types of health injury or disease that may be produced by a chemical and on the conditions of exposure under which injury or disease is produced.

2. Dose-Response Evaluation: The evaluation of the quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease.

3. Exposure Assessment: The estimation of the nature and size of the population exposed to a substance and the extent of toxic injury or disease.

4. Risk Characterization: The integration of the analysis from the previous three components to determine the likelihood that humans or other organisms will experience an effect of concern.

As a general comment, we feel that the citations in the various EPA documents can be improved. We recommend:

1) References should be to the original source, not a review or a government document, e.g., "U.S.EPA".

2) If "U.S.EPA" is appropriate (e.g. extracting a net conclusion from literature sources) the relevant page number(s) should be included in the reference. Otherwise, the citation is almost useless.

The above are standard practices for good reason, but are not adhered to in the technical support documents.

Hazard Identification

The Risk Assessment group did not address the completeness of the list of chemicals considered.

Blood lead and blood pressure

The Agency chose to use a two-pronged attack to calculate the effects of lead. Approach A used a threshold and estimated the number of individuals raised above thresholds for blood leads which were 7 µg/dl for elevating blood pressure in middle-aged white males and 12.5 µg/dl for women and young children. These respective values are not firmly established as either significant effect levels or thresholds, but their use for this purpose seems reasonable at this time. However, Approach B attempts to estimate the number of middle-aged males above the blood lead thresholds who would be expected to develop disease because of the elevated blood pressure. The scientific basis for this latter extrapolation is subject to question. Sharp et al. (1987) reviewed the data on lead and blood pressure and noted that while "These data suggest an association between past occupational lead exposure and hypertensive heart disease," the mediating link is "circumstantial." We believe that it is a leap of faith to attempt to calculate cases by Approach B and that only Approach A should be used for that aspect. We have no problems with Approach B for women (i.e., calculating the percentage of women pregnant with blood leads over the threshold) or for children where every child above the threshold is a potential case.

Cadmium toxicity

The weight of evidence suggests that elderly women are the most sensitive population to cadmium toxicity as a result of their cumulative body burden resulting from longer life spans. Attention is called, however, to the fact that recent evidence points to the fetus as a possible candidate for the "most sensitive individual." Thus, there is a high negative correlation between placental cadmium exposure and physical development (Ward et al., 1987). It is well-known that smoking has a similar depressive effect on fetal development. Smoking also results in a substantial increase in the body burden of Cd and may depress fetal development due to factors other than Cd, e.g., CO and nicotine. The Cd correlation, however, was present even in the non-smokers. One other study also shows a relationship of Cd to birthweight, at least among smokers (Kuhnert et al., 1987). Maternal blood Cd accounted for 7.1% of the variance in fetal birth weight. Animal studies suggest a plausible mechanism for the Cd effect, reduction in placental blood flow (Levin and Miller, 1981). On the other hand, the Joint FAO/WHO Expert Committee on Food Additives (JECFA, 1989) recently considered these issues and decided to retain the kidney as the primary target organ of concern (JECFA, 1989). Their recommendation was that dietary Cd be less than or equal to 1 µg/kg body weight for adults.

Dose - Response Evaluation

Reliance on data generated under artificial conditions

Biological systems are complex and behave differently from simple models. Thus, it is difficult to extrapolate greenhouse data to the field (in the case of phytotoxicity) or animal data to humans (in the case of human toxicology). Consequently, risk assessors dealing with human risk always look for human data (epidemiological studies of occupational or population groups) to corroborate animal data. When the results from animal studies disagree with those from human studies, there is a natural presumption that the results from the human studies are more reliable than those from animal studies, given equal study quality. This presumption is based on the fact that the target organism is a human and the uncertainties inherent in extrapolation from animals to humans, and from high to low dose (as is generally the case) are avoided.

A similar choice often occurs between in vivo versus in vitro data. Because of the complexity of biological systems, in vivo data is preferable because it reflects the entire organism, with all its homeostatic mechanisms intact. Similarly, it is reasonable to be skeptical of data on phytotoxicity that is obtained from pot studies as opposed to field studies. There are numerous factors that differ between the pot and field environments such as the molecular form of the toxin under consideration.

One behavior that is particularly difficult to model is the no effect level. Most low-dose extrapolation models are linear and assume a response to any stimulus, no matter how small. However, thresholds are often observed in nature. If there are field or epidemiological data that indicate the existence of a no effect level or there is reason to believe there is a threshold, then instead of relying on linear models, EPA should examine the database to see if it can establish a NOAEL (No Observed Adverse Effect Level) or LOAEL (Lowest Observed Adverse Effect Level) as a means of deriving a maximum allowed concentration or loading.

Inappropriate choices of data

Good scientific judgement should be used in choosing data for development of limits on pollutants. An example of an inappropriate choice of data is found in the consideration of lead toxicity to avian species. The lead toxicity data cited by EPA on chickens, quail and ducks are all relatively consistent except for the one study used by EPA to select a threshold feed concentration of 39.6 μg Pb/g DW (another glaring example of too many significant figures). Table 4-60 in the Technical Document on Land Application and Distribution and Marketing lists the studies considered by EPA and the doses and responses found in each study. Three studies showed no adverse effect at 100 μg/g DW over periods of 28-56 days. Five studies showed mild toxicity, such as decreased weight gain and feed use at 500-2000 μg/g DW over 28-56 days. Four studies found 10-50% mortality at 2000 to 10,000 μg/g DW over 11-42 days. One study showed "mortality" (no mention of how much) at 200 μg/g DW for "subacute" durations. Another study showed "death in 19-27 days" at 60 μg/g DW, while another (by the same author) showed death in "24-41 days" at 46 μg/g DW. It was the latter study that EPA chose to use. That study was the oldest of those considered (the paper appeared in 1951) by 15 years. In view of the advances in toxicology and analytical chemistry that occurred between 1951 and the 1970's when most of the papers appeared, it is peculiar that EPA made this choice. This would appear to be another example of the science being dictated by policy choices.

The Coburn et. al. (1951) study used by EPA is an outlier. The methods used by EPA can be used to develop a threshold from the other studies. These other studies consistently give a NOAEL of 100 μg Pb/g DW and a LOAEL of 200-500 μg Pb/g DW. Using EPA's approach of taking the geometric mean of the NOAEL and LOAEL would give a value of 140-225 μg Pb/g DW instead of 46.

The Land Application Workgroup report contains more detailed analysis of EPA's discussion of this pathway. Their analysis indicates other, more serious, errors than that presented here. But this use of "outlier" data is indicative of serious problems in the EPA analysis.

Pathogens

There is some concern regarding EPA's treatment of pathogens. While it was stated that the state-of-the-art was such that a risk assessment for pathogens was not possible, we feel that this point was glossed over rather quickly and needs greater justification.

Indeed, another office of EPA, the Office of Drinking Water, in a recently published document entitled "Comparative Health Effects Assessment of Drinking infection from echoirus-6 exposure due to consumption of water containing one viral infectious unit per 1000 liters to be 10^{-3} and the annual risk of mortality for the same exposure to be less than 10^{-5}. Risk estimates were also obtained for exposure to hepatitis and other pathogens. These estimates were apparently based in part on a paper by Gerba and Hass (1986).

Use of nondetectable concentration

In the proposed rule, EPA has consistently chosen to deal with the problem of values below the detection limit by assuming them to be at the detection limit. This can lead to cascading errors. In particular, there is a problem with organics and pathways from the sludge to soil and plants.

Exposure pathways 1, 2, 5, and 7 deal with transfer of pollutants from the sludge to soil and to plants; from the plants they may be transferred to animals and to people, either through eating the plants or the animals. These pathways consider toxicity to the plants, to herbivores, and to people. Pathway 9 considers uptake of pollutants from the sludge by soil biota, and then by animals that feed on the biota.

One of the critical parameters in the equation for calculating the upper limit on the rate of application of sludge to agricultural land is the quantity transferred from the soil to the plant or to the soil biota. This quantity is expressed by the slope, VC, which is defined as

$$VC = \frac{\text{concentration in tissue (of the plant or soil biota)}}{\text{concentration in soil}}$$

where the relationship may, in fact, be non-linear e.g.

$$VC = \frac{(\text{concentration in tissue})^{1/2}}{\text{concentration in soil}}$$

When the concentration of the pollutant in either the tissue or the soil is less than the analytical detection limit, the lower limit of detection of the analytical method is assigned as the concentration. If both the tissue and the soil concentrations are below the lower limit of detection, the value of the slope is one. This arbitrary value of one (for which there is no basis in fact), has a profound effect on the calculated maximum rate of application of sludge, and introduces a large degree of uncertainty in the calculated results.

Surrogates

Another approach is to consider a surrogate (for example, benzo-a-pyrene is often used as a surrogate for polycyclic aromatic hydrocarbons) as opposed to performing numerous individual calculations for individual chemicals as part of the Rules. Rules can be developed by using sludge measurement data to select a single (or a few) relevant value for sludge application management. If the available data are insufficient to calculate risk with a reasonable degree of a single (or a few) relevant value for sludge application management. If the available data are insufficient to calculate risk with a reasonable degree of certainty on the large number of chemicals and pathways considered, it would be more appropriate to base the proposed limits upon surrogate chemicals and scenarios for which data are relatively complete.

EXPOSURE ASSESSMENT

Most Exposed Individual (MEI)

EPA is proposing Rules to "protect public health and the environment from any reasonably anticipated adverse effects of certain pollutants which may be present in sewage sludge. To establish standards for the disposal of sewage sludge, the Agency evaluated the effect of a pollutant on the MEI, and on the population as a whole (aggregate risk analysis).

In our judgement, the definition of the "most exposed individual" used by the Agency is not consistent with the Agency's intent to protect the public health and the environment from reasonably anticipated adverse effects associated with potential sewage sludge exposure. The scenario of exposure assessed for the MEI is unreasonable (overly conservative) for the vast majority of individuals in the general population, and substantially overestimates actual exposure for the sector(s) of the population with the highest potential exposures from sewage sludge.

As an example of the unrealistic nature of the MEIs used, in the case of non-carcinogens, the 25-30 year old man is the MEI in pathways leading to man. This is so in all cases except for direct soil ingestion, in which case the child < 6 years is used. This seems overly simplistic. The MEI for human ingestion of food derived from sludge-amended soil varies from one non-carcinogenic metal to another. As an example, as discussed earlier, if nephrotoxicity is used as the critical endpoint for the toxicity of cadmium in humans, the MEI is probably the elderly woman. If, on the other hand, one agrees with recent information suggesting that the MEI is the fetus, the appropriate MEI is the pregnant woman. Need to consult appropriate biologists also is evident in the case of identification of the duck as the MEI for lead. Ducks apparently do not tend to forage in fields for earthworms. A Canadian Goose or some other species may be a more appropriate MEI. For further discussion regarding problems with this MEI, see the section on Lead: Pathway 9 of the Land Application report.

Regardless of which human MEI is used, dietary intake of pollutants should take into account the shifting relative and total consumption of dietary constituents as a function of sex and age, as was mentioned earlier.

Relevant expertise which takes into account all readily available data was not used as an integral part of the risk assessment in the development of these scenarios. It is unreasonable to create a scenario that results in a 10^{-2} individual life time cancer risk if the probability of this scenario occurring is of the order of 10^{-4} per lifetime. It appears that the MEI is a set of unreasonable scenarios (of low probability of occurrence).

The MEI can be developed from consideration of exposures over a lifetime that results in an individual risk distribution (e.g. lognormal). This allows selection of a certain point in the distribution (e.g. 90th or 98th percentile) to represent the MEI for development of calculational algorithms for regulatory purposes. This approach should use the databases consistent with the relevant expertise on the pathways under consideration. Policy, or lack of positive findings, should not cloud this process. The estimates of relevant parameters and variables can include some of the assumptions applied in the current proposal, but those features considered "extreme" estimates should be identifiable as such in the development of a revised and more realistic MEI. The concept of MEI (which implies a least upper bound) should be replaced by an exposure unit which is reasonably calculable (RCEU).

Exposure Models

Biokinetic models are often used as surrogates for real data on real people. A number of different models, of varying degree of complexity are in use. For example, in determining the limits for airborne concentrations of radioactive particulates, use is made of the multi-compartment lung model published by the International Commission on Radiological Protection (ICRP). This model considers particle size distribution and solubility of the aerosol. These considerations lead to realistic estimates of the quantity and site of deposited particulates and to the translocation kinetics of the deposited particulates. In contrast to this relatively sophisticated - yet practically useful - lung model, the proposed Rule is based simply on daily deposition and retention of all the particulates suspended in 20 cubic meters of air. This leads to a highly unrealistic overestimate of the risk from airborne particulates. The same oversimplifications and consequent overestimation of risk characterize the assumptions applied to gastrointestinal absorption from ingestion of pollutants in the EPA risk analyses.

We recommend that scientific data for intake and absorption of specific chemicals be used to determine maximum acceptable inhaled or ingested quantities. In the absence of chemical-specific data, biokinetic models that realistically describe the intake, uptake, deposition, and elimination of the pollutants of concern should be applied.

A good example of model application, and perhaps the most critical one here, involves the uptake of lead from soil by young children. The considerations for the child ingesting soil/sludge mixtures lead to a cumulative loading limit of 195 kg/ha, or an additional 97.5 mg/kg. These values, totaling 73.5 mg/kg and 108.5 mg/kg when background is included, are unrealistically low, and are well within the range found in relatively non-sludged soils in most urban areas.

The problem of finding a protective concentration of lead in sludge/soil mixtures is divisible into two general question 1) how much soil do children ingest? and 2) how readily absorbed are sludge-derived pollutants in soil? EPA has developed a biokinetic model for lead uptake from multiple sources (U.S.-EPA, 1986). This model includes soil and dust as sources. Blood lead concentration (PbB) is used as the surrogate for internal dose. This is for two reasons: 1) the model can be validated because data sets are available relating soil Pb to PbB and 2) the toxicological consequences of Pb exposure can be readily assessed using PbB as the dose component of "dose-effect."

We suggest that EPA consult its staff paper (U.S.-EPA, 1986) and Hoffnagle and Decesar (1987). The latter report is essentially a validation exercise, using actual PbB and soil Pb data from three major field studies. From these two documents, a scientifically-derived estimate of the impact of sludge-amended soil on lead exposure in children can be achieved. A recent EPA study for the Bunker Hill Superfund Site (U.S.-EPA, 1988) used this approach. The conclusion reached was that "maximum protection (in the absence of an intervention program) is expected to be at soil/dust lead concentrations of approximately 250 mg/kg (to yield blood lead levels of approximately 10 μg/dl for < 3% of the population))." Such a level would allow a cumulative loading of approximately 500 kg/ha by sludge application. This number is not significantly different from the 300 mg/kg or 600 kg/ha recommendation that is discussed in great detail in the Land Application Section of this report. The Risk Assessment Subcommittee agrees that 300 mg/kg or 600 kg/ha presents a low risk to the highly improbable event of a pica child chronically consuming sludge/soil mixtures.

EPA apparently has several groups working on lead-related risks. The Agency should consider trying to pull together these efforts to develop a consistent approach.

RISK CHARACTERIZATION

Best Estimates and Uncertainties

Using risk assessment to develop acceptable concentrations for various sludge disposal practices is admirable. Unfortunately, the application of the risk assessment methodology is inconsistent between the disposal practices in terms of both the assumptions and data. Examples of data inconsistencies are readily apparent in EPA's use of medians, means, and 98th percentile. Where upper bounds and safety factors are applied they should be clearly described and justified as policy rather than scientific decisions.

The key criticism of the approach is the use of maximum or upper bound estimates when data to support realistic estimate are available. This criticism is important because the inconsistent treatment of relevant data may force choosing a disposal option that results in higher risk than that based on a more consistent (or fairer) treatment of the data. When EPA scientists were asked why best estimates were not provided with the associated ranges of uncertainty, the answer was "we don't know how." In our judgement, worst case risk assessment may be useful for screening, but not for management of the sludge disposal options. A best estimate of the risk with a probable upper bound and a probable lower bound should be presented for policy decisions and development of regulations.

The aggregate risk assessment applied for lead and cadmium appears to be an initial attempt at a meaningful best estimate. For carcinogens, presentation of the results based on the maximum likelihood estimate in addition to the 95% upper bound Q_1^* results should be considered. For both carcinogens and noncarcinogens, the analysis should use more realistic assumptions with an appropriate uncertainty bound on the result. The bounds would not necessarily be used in the ultimate regulatory decisions, but would aid assessment of the differences between use of the individual risk and the true impact of the rule on the overall populations-at-risk.

Incineration

The incineration analysis considered the sensitivity of the ambient air concentrations around the incinerator as a function of meteorology, stack height and gas temperature (Abt, 1989). Using the sensitivity analysis, EPA calculates allowable sludge pollutant concentrations using a simplified air model based on stack height and pollutant control efficiency for a risk specific dose (RSD). Under the proposed Rule, the facility can demonstrate compliance at any of three levels of increasing complexity: 1) using the EPA dispersion factor and control efficiencies contained in the proposed Rule, based on a simplified air dispersion analysis technique, 2) using the site-specific values for dispersion factors while using the control efficiencies provided in the Rule, and 3) using site-specific dispersion factors and control efficiencies (requires performance tests and stack sampling of incinerator emissions to compute control efficiencies).

The question is why site-specific modeling with POTW-specific data that allows use of the modeling feature available (e.g. particle-size distributions and dispersion-by-size class) should not be allowed? The development of simplified techniques presents problems that would be avoided by site-specific analyses, which may be in reality easier (especially if air quality results are needed for other regulatory concerns). As an example, the measured metal content of the sludge and the sludge incineration rate can be used as the source term calibration with measured particle-size distributions at the stack exit for particle-size class dispersion. Appropriate settling velocity and deposition partitions can be used to calculate the ambient concentrations in particle-size classes available for inhalation and the deposited particles available for human exposure via other pathways. The particles below 0.1 μm mean aerodynamic diameter can be assumed to be re-respired and those greater than 10 μm to be stopped in the nasal passages. Thus, only a fraction of the emissions will be available for inhalation and pollutant dose in the human lung. In the case of oil combustion, two distinct particle-size classes have been observed with a break at about 10 μm. Only 50% of the pollutant available for the "lung exposure." If this result were typical, and a 50% deposition were considered, the RSD could be increased by a factor of 4.

Other concerns also arise from the risk assessment review of incineration. One of these is the grid used. Why use a 50 km polar grid when most of the exposure is within the first km? It is predicted that closer spacing will result in higher maximum ground level concentrations than the current methodology.

The primary concern should not be the MEI but the amount of pollutant released that enters a human. The total amount of pollutant that is calculated to be inhaled represents only a small fraction of the total amount released. This fraction can be estimated using a representative mixing height and concentration for the entire area. Much of the pollutant leaves the 50 km circle and represents a potential health impact in populations from long range transport of the pollutants. The use of Carcinogen Assessment Group (CAG) risk and potency factors means that even low levels in very large populations may result in significant numbers for aggregate health impacts.

Methods are available to estimate these risks. Treatment of each known carcinogen for which factors are known represents a large uncertainty. The small number of carcinogens that are considered in this analysis makes one wonder how many have been omitted. If it is a few, the results are relevant. But if it is tens of thousands, the risks may be drastically understated. An approach to this problem would be to use a "sludge surrogate" for all causes of premature death. Fine particulates emitted from an incinerator stack may be a more appropriate measure all health impacts resulting in premature death. The application of such a surrogate would illustrate the risk management preference for "land related" forms of sludge disposal.

The Technical Support Document had some inconsistencies and/or typographical errors that need to be addressed. On page 1-2, the MEI is stated to "absorb 100% of all pollutants inhaled" but on page 5-8 the statement about the dose received by the MEI is "with 75% of the contaminant mass being absorbed into the body."

Another picky comment concerns the example calculation to determine the sludge concentrations on page 5-12. The control efficiency (FE) is assumed to be 95% but the equation used is FE = (1 - 0.96) = 0.04 with a further confusing reference to Table 7-2 (which is 96% for chromium).

Numerical Example

A numerical example was constructed to illustrate some of the proposed methodology improvements. The example is related to metal ingestion as considered in pathway 2F. The example concerns the estimate of change in the concentration of pollutant X (e.g., Pb) in the blood of young children due to ingestion of soil/sludge mixtures. The calculation is:

$$XB = A \cdot B \cdot C \cdot D \cdot k \cdot (\mu g/dL)$$

where XB is the blood concentration of pollutant X, A is the concentration of X in the sludge/soil mixture (in μg X/g sludge/soil), B is the soil ingestion rate for children (mg soil/day), C is the percentage of total soil ingested that is soil/sludge (%), D is the change in blood X (μg/dL) per μg/day ingested and k is a constant for adjustment of the units ($k = 10^{-3}$ mg/μg x 10^{-2}/% = 10^{-5}). (Note that the EPA Rule is based on using A as an unknown with C as 100% and solving for the change in blood level with respect to a threshold.)

Instead of single values, a set of three values for each variable are considered in Table 1 where the middle value is a "best estimate" and the low and high represent "liberal and "conservative" estimates.

There are a myriad of methods to analyze the tabulated data. It appears the EPA approach is to construct a "worst case" type of scenario. This implies that all high values would be used. That is, the "MEI" value is

$$XB_{max} = 1000 \times 500 \times 70 \times 0.15 \times 10^{-5} = 52.5\ \mu g/dL$$

If a "policy decision" is made by using more representative values, say 50 mg/day ingested (the median value for soil ingestion [Calabrese et al., 1988]), 50% of the soil ingested as sludge instead of 70% and 0.1 as the change in blood lead per μg X/day instead of 0.15, the result is

$$XB = 1000 \times 50 \times 50 \times 0.1 \times 10^{-5} = 2.5\ \mu g/dL.$$

This new value then has a result with policy decision in the data selection imbedded into the estimation process.

Table 1 Example Case Values for Variables

	Value			
Variable:	A	B	C	D
Low	10	10	5	0.07
Middle	100	50	10	0.10
High	1000	500	70	0.15

The example data set represented by Table 1 allows for $3^4 = 81$ individual outcomes that can be calculated. The relation of the values of 52.5 μg/dL and 2.5 μg/dL can be related to these possible outcomes or a distribution function for the change in blood lead based on distributions for the individual variables. As an illustration, a distribution function assuming these outcomes are equally likely results in 2.5 μg/dL as the 88th percentile and 52.5 μg/dL as the 98.8 percentile (80/81). The 50th percentile is 0.05 μg/dL. This value is a factor of 10^3 less than the "MEI" value.

The appropriate method for the estimate is to provide a reasonable set of values for each estimate, estimate the distribution of the desired quantity and then make the policy decision on the final (e.g., risk) distribution. This method could avoid generation of MEIs based on unreasonable scenarios.

To continue the example, the probabilities of the individual high and low values can be varied. The other cases to be considered are the case where middle values are twice as likely as either the high or low, which are of equal probability, and the case where the middle value has a probability of 80% and the high and low are of equal probability (10%). The numerical results describing the resulting discrete probability and cumulative distribution functions are shown in Table 2. Figure 1 illustrates the resulting probability density functions. For the case of the high and low at half of the middle probability, 2.5 μg/dL corresponds to the 91.3th percentile and 52.5 μg/dL to the 99.6th percentile. The case where the high and low are at 10% probability, 2.5 μg/dL is the 98.1th percentile and 52.5 is the 99.99th percentile. In all three cases the 50th percentile is 0.05μg/dL. The cumulative distribution can then use a stated policy decision to regulate based on the 90th percentile by selecting a value of either 3.5, 1.75, or 0.245 μg/dL depending on which case is selected to be representative.

The impact of the assumption on the individual distributions can be studied using a sensitivity analysis. Actually, log normal fits to the data are often appropriate and would obviate the need for selection among the cases. The use of continuous distributions using nonparametric methods to obtain estimates for an assumed log normal fit for the calculated result (e.g., risk) is recommended. Further effort on this type of analysis may help reveal the difficulties with the MEI approach as now used (e.g., how extreme the percentile of the scenario becomes even though the techniques used have difficulties at the "tails" of the distribution).

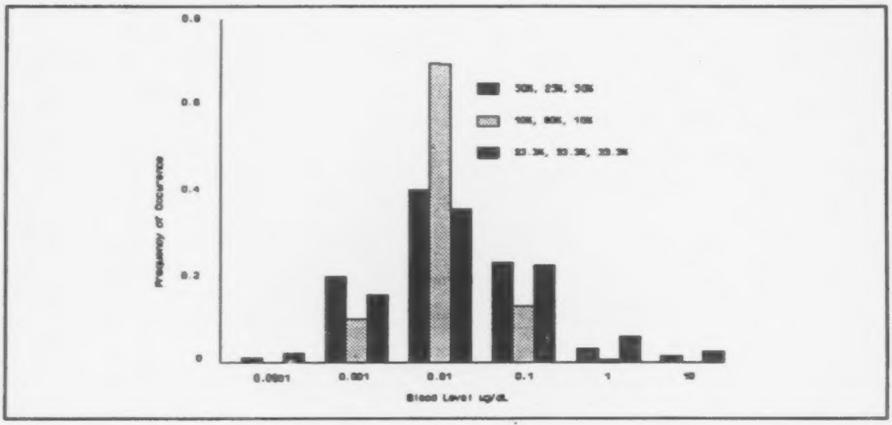

Figure 1. Example Probability Density Function

Table 2 Example Case Calculated Probabilities

Number	Change in X Lead	Case A: High, Middle and Low Values Equally Likely		Case B: High & Low at Half of Middle Value Probability		Case C: High & Low Values at Probability of One-tenth	
		Frequency	Cumulative Frequency	Frequency	Cumulative Frequency	Frequency	Cumulative Frequency
1	0.0004	0.0123	0.0123	0.0042	0.0042	0.0001	0.0001
2	0.0005	0.0123	0.0247	0.0083	0.0125	0.0069	0.0070
3	0.0007	0.0123	0.0370	0.0083	0.0208	0.0001	0.0071
4	0.00075	0.0123	0.0494	0.0042	0.0250	0.0009	0.0080
5	0.001	0.0123	0.0617	0.0167	0.0417	0.0001	0.0081
6	0.0015	0.0123	0.0741	0.0083	0.0500	0.0009	0.0089
7	0.0018	0.0123	0.0864	0.0083	0.0583	0.0001	0.0090
8	0.0025	0.0123	0.0988	0.0167	0.0750	0.0009	0.0099
9	0.0035	0.0123	0.1111	0.0167	0.0917	0.0001	0.0100
10	0.0035	0.0123	0.1235	0.0083	0.1000	0.0009	0.0109
11	0.00375	0.0123	0.1358	0.0083	0.1083	0.0551	0.0659
12	0.0049	0.0123	0.1481	0.0042	0.1125	0.0009	0.0668
13	0.005	0.0123	0.1605	0.0333	0.1458	0.0069	0.0737
14	0.005	0.0123	0.1728	0.0167	0.1625	0.0009	0.0745
15	0.007	0.0123	0.1852	0.0167	0.1792	0.0069	0.0814
16	0.007	0.0123	0.1975	0.0083	0.1875	0.0009	0.0823
17	0.0075	0.0123	0.2099	0.0083	0.1958	0.0069	0.0891
18	0.0075	0.0123	0.2222	0.0167	0.2125	0.0009	0.0900
19	0.01	0.0123	0.2346	0.0333	0.2458	0.0001	0.0901
20	0.0105	0.0123	0.2469	0.0042	0.2500	0.0069	0.0970
21	0.015	0.0123	0.2593	0.0167	0.2667	0.0001	0.0971
22	0.0175	0.0123	0.2716	0.0042	0.2708	0.0009	0.0980
23	0.0175	0.0123	0.2840	0.0042	0.2750	0.0001	0.0981
24	0.0175	0.0123	0.2963	0.0167	0.2917	0.0009	0.0989
25	0.0245	0.0123	0.3086	0.0083	0.3000	0.0001	0.0990
26	0.025	0.0123	0.3210	0.0333	0.3333	0.0009	0.0999
27	0.025	0.0123	0.3333	0.0083	0.3417	0.0001	0.1000
28	0.025	0.0123	0.3457	0.0083	0.3500	0.0009	0.1009
29	0.035	0.0123	0.3580	0.0333	0.3833	0.0551	0.1559
30	0.035	0.0123	0.3704	0.0083	0.3917	0.0009	0.1568
31	0.035	0.0123	0.3827	0.0167	0.4083	0.0069	0.1637
32	0.035	0.0123	0.3951	0.0042	0.4125	0.0009	0.1645
33	0.035	0.0123	0.4074	0.0083	0.4208	0.0069	0.1714
34	0.0375	0.0123	0.4198	0.0042	0.4250	0.0009	0.1723
35	0.0375	0.0123	0.4321	0.0042	0.4292	0.0069	0.1791
36	0.0375	0.0123	0.4444	0.0167	0.4458	0.0009	0.1800
37	0.049	0.0123	0.4568	0.0083	0.4542	0.0069	0.1869
38	0.05	0.0123	0.4691	0.0167	0.4708	0.4404	0.6273
39	0.05	0.0123	0.4815	0.0083	0.4792	0.0069	0.6342
40	0.05	0.0123	0.4938	0.0667	0.5458	0.0551	0.6892
41	0.05	0.0123	0.5062	0.0167	0.5625	0.0069	0.6961
42	0.0525	0.0123	0.5185	0.0083	0.5708	0.0551	0.7512
43	0.07	0.0123	0.5309	0.0083	0.5792	0.0069	0.7581
44	0.07	0.0123	0.5432	0.0167	0.5958	0.0551	0.8131

Table 2. Continued

Number	Change in X Lead	Case A: High, Middle and Low Values Equally Likely		Case B: High & Low at Half of Middle Value Probability		Case C: High & Low Values at Probability of One-tenth	
		Frequency	Cumulative Frequency	Frequency	Cumulative Frequency	Frequency	Cumulative Frequency
45	0.075	0.0123	0.5556	0.0083	0.6042	0.0069	0.8200
46	0.075	0.0123	0.5679	0.0083	0.6125	0.0009	0.8209
47	0.075	0.0123	0.5802	0.0333	0.6458	0.0551	0.8759
48	0.075	0.0123	0.5926	0.0042	0.6500	0.0009	0.8768
49	0.1	0.0123	0.6049	0.0167	0.6667	0.0069	0.8837
50	0.105	0.0123	0.6173	0.0083	0.6750	0.0009	0.8845
51	0.15	0.0123	0.6296	0.0083	0.6833	0.0069	0.8914
52	0.175	0.0123	0.6420	0.0083	0.6917	0.0009	0.8923
53	0.245	0.0123	0.6543	0.0042	0.6958	0.0069	0.8991
54	0.245	0.0123	0.6667	0.0042	0.7000	0.0009	0.9000
55	0.245	0.0123	0.6790	0.0167	0.7167	0.0001	0.9001
56	0.25	0.0123	0.6914	0.0167	0.7333	0.0069	0.9070
57	0.35	0.0123	0.7037	0.0083	0.7417	0.0001	0.9071
58	0.35	0.0123	0.7160	0.0167	0.7583	0.0009	0.9080
59	0.35	0.0123	0.7284	0.0083	0.7667	0.0001	0.9081
60	0.35	0.0123	0.7407	0.0333	0.8000	0.0009	0.9089
61	0.375	0.0123	0.7531	0.0083	0.8083	0.0001	0.9090
62	0.49	0.0123	0.7654	0.0042	0.8125	0.0009	0.9099
63	0.5	0.0123	0.7778	0.0333	0.8458	0.0001	0.9100
64	0.525	0.0123	0.7901	0.0042	0.8500	0.0009	0.9109
65	0.525	0.0123	0.8025	0.0167	0.8667	0.0551	0.9659
66	0.525	0.0123	0.8148	0.0042	0.8708	0.0009	0.9668
67	0.7	0.0123	0.8272	0.0083	0.8792	0.0069	0.9737
68	0.75	0.0123	0.8395	0.0167	0.8958	0.0009	0.9745
69	1.05	0.0123	0.8519	0.0042	0.9000	0.0069	0.9814
70	1.75	0.0123	0.8642	0.0042	0.9042	0.0009	0.9823
71	2.45	0.0123	0.8765	0.0083	0.9125	0.0069	0.9891
72	2.5	0.0123	0.8889	0.0083	0.9208	0.0009	0.9900
73	3.5	0.0123	0.9012	0.0167	0.9375	0.0001	0.9901
74	3.5	0.0123	0.9136	0.0083	0.9458	0.0069	0.9970
75	3.75	0.0123	0.9259	0.0042	0.9500	0.0001	0.9971
76	5	0.0123	0.9383	0.0167	0.9667	0.0009	0.9980
77	5.25	0.0123	0.9506	0.0083	0.9750	0.0001	0.9981
78	7.5	0.0123	0.9630	0.0083	0.9833	0.0009	0.9989
79	24.5	0.0123	0.9753	0.0042	0.9875	0.0001	0.9990
80	35	0.0123	0.9877	0.0083	0.9958	0.0009	0.9999
81	52.5	0.0123	1.0000	0.0042	1.0000	0.0001	1.0000
	Totals	1.0000		1.0000		1.0000	

Values for individual components of calculation for change in Bl Level of pollutant X (XB = A B C D) are in Table 1.

EPA DOCUMENTS AVAILABLE FOR THE RISK ASSESSMENT REVIEW

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LAND APPLICATION - AGRICULTURE

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SUMMARY

1. The EPA documents (Proposed Rule and Technical Support Document) suffered from serious scientific deficiencies. Corrections of these deficiencies showed that application of median sludges at agronomic rates comprised little risk to humans, livestock, wildlife, or the environment when utilized on agricultural land.

   a. Only data from field studies of sludge-applied metals should be used to derive pollutant transfer coefficients. Such data are readily available, including important "No-Adverse-Effect" data that should not be ignored in preparation of this Rule.

   b. Data misinterpretation and misuse was common in the TSD. Scientists knowledgeable about the fate and effects of sludge-applied pollutants should be enlisted to assure correct interpretation of research data. During the present evaluation, only part of the data in the TSD were reviewed.

2. The risk assessment components of the EPA Proposed Rule and TSD need considerable improvement.

   a. The Most Exposed Individual definition and use are unrealistic and cause false estimations of risk.

   b. Diet scenarios are inappropriate.

   c. Relative effectiveness of Dose coefficients were assumed by EPA to be 1 in nearly all cases, but appropriate data indicate that they should have been << 1 in many cases significant to the proposed Rule.

3. Computer models of risk assessment from sludge-applied pollutants are inadequate. Conceptualization is poor, and validation with field results was missing.

4. The Proposed Rule suffers from problems in analysis of pollutants in sludges. Proposed techniques should be verified in sludge matrices. Further, limits of detection in analytical techniques were misused in estimating pollutant transfer coefficients.

5. Additional sludge constituents need consideration in the Proposed Rule. Sludge F and Fe can cause toxicity to livestock and wildlife by direct ingestion of some sludges.

6. Those sludges ("Clean Sludges") which contain low enough concentrations of pollutants that they can be used on agricultural land with no significant risk to humans, livestock, wildlife, or the environment should be placed in a separate category and constrained by labeling.

INTRODUCTION

Land application is an efficient, cost-effective method of sludge disposal that also recycles plant essential nutrients in the sludge to the soil-plant system. Sludge additions can also improve soil physical and chemical properties. Thus, land application of sludge in the agricultural sector is responsive to EPA's policy of promoting beneficial use of sludge.

Balanced against these well-documented benefits of agricultural utilization of sludge are environmental concerns based on potential risks arising from heavy metals, toxic organics, and pathogens in the sludge. Excessively high rates of sludge application can also cause excessive levels of soluble salts that can reduce plant yields, or excessive leaching of NO_3-N. Straightforward management procedures can solve the salinity problem and prevent excessive nitrate leaching. These issues will, therefore, not be considered further.

The EPA has proposed a Rule (Federal Register 54:5746-5902, 1989) for the disposal of sewage sludge when sludge is applied in various land use scenarios. This discussion centers on various aspects of the Rule as it applies to agricultural use.

The Rule, as proposed, threaten to severely limit agricultural use of sludge based on risk assessment associated with various pathways of transfer of sludge constituents to humans, animals, and biota, and with environmental damage. We believe the analysis to be flawed on several counts and attempt to document them below. Our approach was to address several issues associated with the analysis generically, and to provide specific examples of critical review for the most-limiting pathways and constituents. As time and resources permitted, we suggested alternative approaches to protect against identified risks, indicated data representing a more appropriate basis to compute the transfer coefficients, relative effectiveness, and other estimates needed to compute each pathway. Where possible, we estimated the more appropriate limits of application for a reviewed pathway/constituent after correcting identified errors in the Technical Support Document (TSD). The reader should note that for clarity, we used the abbreviation mt = metric ton where the TSD used Mg = megagram = 1000 kilograms. Further, abbreviations which are not defined in this document are those of EPA from the TSD.

We did not regard it as our responsibility nor did time permit us to correct every error in the Proposed Rule or in the TSD. We trust that EPA will accept the examples given as impetus to review the entire process with input from sludge experts.

GENERIC ISSUES

Metals

Use of data from studies of soluble metal salt additions to pots in place of sludge-applied metals in the field to estimate slopes of plant uptake: Metals in sludges occur in many different forms, some of which have very limited solubility. As a result, the metal activity and soil solution concentrations supported by a given soil-sludge mixture will often be orders of magnitude lower than those supported by the same amount of metal added to soil as soluble salts. Thus, the plant uptake slopes for metal salt additions are much higher than with sludge borne metals. Additionally, the predicted phytotoxic soil metal levels, so important in certain pathways of the risk assessment, are much lower with soluble metal salts than with sludge-metals. This effect is illustrated dramatically by the data of Hinesly et al., 1984 (Figure 1). In their study, Cd additions were made as $CdCl_2$ or as sludge-borne Cd, at various soil Cd loadings. There is a clear difference in plant response (uptake, tissue concentration) between the two Cd sources. Sludge-borne Cd data suggest a plateauing in plant responses with increasing Cd additions. Similar data are available for other sludge-borne cationic metals (Corey et al. 1987). Both curves could be extrapolated to tissue Cd contents associated with phytotoxicity (200 mg/kg DW leafy vegetable; Mahler et al. 1978). The difference is that the Cd application corresponding to this tissue Cd level would undoubtedly be greater with sludge-borne Cd than $CdCl_2$ (if indeed the sludge Cd line ever reached 200 mg Cd/kg DW). The difference in plant uptake of metals applied as metal salts vs. as sludge is probably similar for Zn, and even greater for the more strongly bound metals such as Cr, Ni, and Cu. Results such as these are the basis for the strong recommendation of Page et al. (1987) that data derived from soils treated with metal salts should never be used as surrogates for sludge-metal studies.

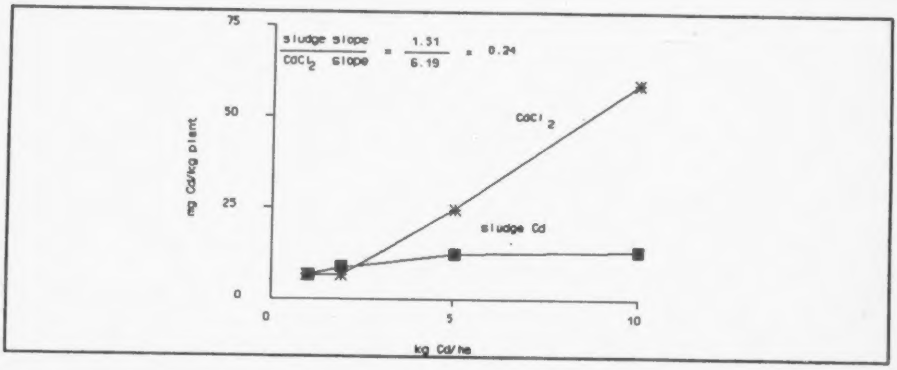

Figure 1. Comparison of crop uptake of Cd from a soil with additions of $CdCl_2$ vs. sewage sludge.

Lowest "no-adverse-effect" sludge rate data should not be ignored: Research has shown that data from sludge-borne metals used in field studies after 1 or more years, with biologically-processed sludges, are the only valid data for evaluating plant responses. Such studies often result in plant tissues with metal levels insignificantly different from controls. Such "no-adverse-effect" data were ignored by EPA in evaluating phytotoxicities, often in favor of data from metal salt studies, where the level of metal additions were not as high. We maintain that the "no-adverse-effect" data are, in fact, of prime importance in a meaningful evaluation of potential for risk. The highest metal application rate which causes no significant yield reduction of sensitive crops grown in acidic sludge-amended fields is a valid number in estimating phytotoxicity limits. This number is even more critical where no valid field study demonstrating phytotoxicity from sludge-applied metals exists.

Use of yield depression as an indicator of individual metal phytotoxicity: Yield depressions can result from many factors, particularly when very high sludge rates are used, and when data are collected the first or second year after sludge application. High sludge additions can result in excessive accumulation of soluble salts in soils. The problem can be severe in greenhouse pot studies, but can also occur in the field, particularly on fine-textured soils. High single applications of sludge almost always produce excessive amounts of mineral N which can create nutrient imbalances in plants. Excess N generally favors vegetative growth at the expense of tuber, edible root or seed production (or causes lodgings of grain plants). Thus, decreases in edible product yield may temporarily be associated with N imbalance, not metal toxicity. High microbial activity associated with large sludge additions increase the probability of anaerobic conditions following rainy periods, particularly during the first year after application. This can reduce yields and change relative uptake rates of metals. Further, these conditions increase metal diffusion rates to roots, increasing the soil to plant transfer during the first year. The only way a yield reduction can be reasonably attributed to a phytotoxic level of a specific sludge-borne metal is if the metal concentration in plant leaves (tissue concentration) exceeds a level generally recognized to indicate specific metal phytotoxicity. Even this approach can be compromised if the metabolic processes of the plant have been perturbed by a nutrient imbalance, by soluble salt accumulation, or by toxicity of another element.

Significant figure errors: In many cases, the TSD overstates the number of significant figures for the slopes, etc., obtained by their calculations. The TSD shows three significant figures regardless of the original data from which the indicated numbers were obtained. This is not appropriate, and should be carefully examined during revision of the TSD.

Sludge definition: Careful attention should be given to the definition of sludge when selecting data to estimate pollutant transfer coefficients. Metals in sludges highly polluted by industrial discharges may have received no or ineffective biological treatment; also, metals in these sludges often behave more like metal salts than metals in sludges of typical (median) concentrations. Thus, studies conducted with these materials overestimate the bioavailability of metal in typical municipal sludges.

Appropriateness of references: Critical references were frequently found to be inappropriate for the intended use (see metal salt phytotoxicity discussion above). In a few cases, even these references were misinterpreted. For example, an error in reference interpretation relative to Pb (Pathway 9) reported the data as mg Pb/kg diet when the data were for mg/kg body weight. In other pathways, the TSD recorded metal applications as kg/ha when the actual data were mg DTPA-extractable metals/kg soil. These misinterpretations identified incorrect critical pathways.

Inconsistent application of results: For example, Pathway 8 for Cu utilized data from a study of applied metal salts because sludge-metal studies showed "no-adverse-effect" (see above). With other metals, however, no data of any kind could be found, so no limits were calculated.

Another example is in the Cr risk analysis. Studies of Cr applied in sludges were overlooked in favor of studies of applied Cr salt or Cr-containing industrial wastes. There are several studies of Cr toxicity and plant uptake from serpentine soils. Such soils naturally contain very high Cr levels (≥ 10,000 mg/kg), but exhibit no Cr toxicity and do not cause significant true Cr uptake (see Cr section below). Additional examples are given under the specific pathways studies for "Group I and II" metals (below).

Organics

Toxic organics in sludges present special problems because of analysis complexities, scarce data bases and contamination problems not shared by metals. Investigators have taken several "short cuts" to minimize analytical difficulties and have only learned over long periods the shortfalls of methodic errors. The unsuspecting reader of the literature may be lead into several errors as exemplified in the EPA TSD.

Use of ^{14}C data:. ^{14}C-labeling of compounds can greatly simplify analytical efforts and is much more widely used by researchers than, for example, GC/MS analysis at trace levels. Radioisotope labeling and assay, however, is only appropriately used as a surrogate for the target chemical (parent compound) when the ^{14}C-tag is known to remain with the intact parent compound. If the ^{14}C-compound is degraded in the soil, or is metabolized within the plant, ^{14}C assay is no longer a valid indication of the concentration of the parent compound. The error may be small, or large, depending upon the compound's behavior in soils and plants. In general, ^{14}C-based data (uptake, degradation, etc) must be considered unreliable unless confirmational analysis for intact compound is also available. Unfortunately, unconfirmed ^{14}C data abound in the literature.

Use of data derived from studies that added pure organic compounds, or spiked sludges in studies of organics: Nonpolar organics (PCBs, DEHP, PAHs) are strongly adsorbed by organic matter. If these compounds exist in sludge, their bioavailability can be expected to be different than pure compounds. Much of the early literature on the fate of organics utilized high application rates of reagent grade chemicals. Plant response ("uptake") to such PCB additions (Strek & Weber, 1980) were significantly greater than to sludge-borne PCBs (O'Connor, 1988).

Use of chemical concentrations and/or unique soils not appropriate for evaluation of sludge-amended soils: Early researchers often used very high concentrations of chemicals to facilitate soil and plant analyses. These concentrations (e.g. 20, 100, or even 1000 mg PCBs/kg soil) are totally unrealistic with respect to permissible applications of sludge-borne PCBs. Lower concentrations (0.01 to 1 mg PCBs/kg soil) expected in sludge-amended soils promote very strong adsorption by the amended soil (Fairbanks and O'Connor, 1984), and thus reduced bioavailability. The very limited plant uptake data available are insufficient to demonstrate a linear response to organic loading; in fact, some studies (O'Connor et al., 1989) suggest that plant contamination with PCBs approaches a plateau, similar to the pattern observed for Cd, Cu, Zn, and other metals in sludge-amended soils. Besides use of high concentrations of added compounds, researchers often deliberately used unique soils [sands with extremely low organic carbon (OC) contents] to maximize plant uptake and for analytical ease (e.g., Iwata and Gunther, 1976). Dramatic reductions occur in plant uptake of PCBs when sludge, charcoal, or clay are added to the soils studied (Weber and Mrozek, Jr., 1979; O'Connor, 1988). Unfortunately, some of the more highly cited studies (Iwata and Gunther, 1976) involve high pure chemical concentrations added to "sand" soils. These data are unrepresentative of agronomic applications of organic amendments to agricultural soils.

Insufficient attention given to chemical forms (isomers, congeners, compounds): PCBs and PAHs refer to families of compounds. The term PCBs refers to a family of compounds with the same basic chemical structure but with different degrees of chlorination and isomers thereof. PCBs may consist of a mixture of several congeners, each with different properties. On the other hand, the term PAHs (polycyclic aromatic hydrocarbons) is a much broader term that refers to several different families of compounds with somewhat similar characteristics, but with different basic structures. Studies that do not clearly identify the specific PCBs or PAHs studied have limited usefulness in risk evaluation. Studies with more polar and labile forms of PCBs (Moza et al., 1979) usually exhibit much different plant uptake characteristics than PCBs representative of sludges (much less polar, nonlabile) (Sawhney and Hankin, 1984). Similar data are available (Harms and Sauerbeck, 1983) that demonstrate that the various PAHs have different bioavailabilities.

No distinction between contamination caused by foliar absorption of vapor vs. root uptake: PCBs, in particular, are known to volatilize from surface deposits (or shallow soil) and to be sorbed from the vapor phase by plant tissues closer to the soil (Fries and Marrow, 1981). Little or no PCB is absorbed by plant roots and moved to the leaves in the transpiration stream (Fries and Marrow, 1981; Sawhney and Hankin, 1984). Sludge additions significantly reduce PCB volatilization from soil (Fairbanks et. al, 1987) and thereby likely reduce plant contamination compared to PCBs added as pure compounds. Reagent grade chemical, at high concentrations applied to sands (low OC), would be much less strongly retained by the soil and more likely to contaminate plants.

Errors resulting from assuming that background soils contain no toxic organic compound: Many soils contain residues of pesticides, industrial xenobiotics, and even naturally formed compounds (PAHs) considered toxic (Jones et al., 1989). The literature (eg. Gould, 1966; Edwards, 1973) would suggest that there are probably no land areas in agriculturally important regions that have not suffered some level of pesticide contamination. The bioavailability of the soil residues may be very low (Frink and Bugbee, 1989), but the residues may be extractable. Assuming zero background levels may cause substantial error.

Further error results when a slope is calculated by using the zero background assumption for control soil, and a result in which plant concentration is below the detection limit at all sludge or chemical application rates including zero (Fig. 2). If the bioconcentration factor (tissue concentration/soil concentration) is calculated from the slope of line A, the slope will be zero. If the control is treated as having zero background, and the detection limit used as a real value for the sludge treatment, the slope of line B could be erroneously estimated. Clearly, estimates of chemical bioavailability can be affected by background soil levels and they should not be ignored a priori.

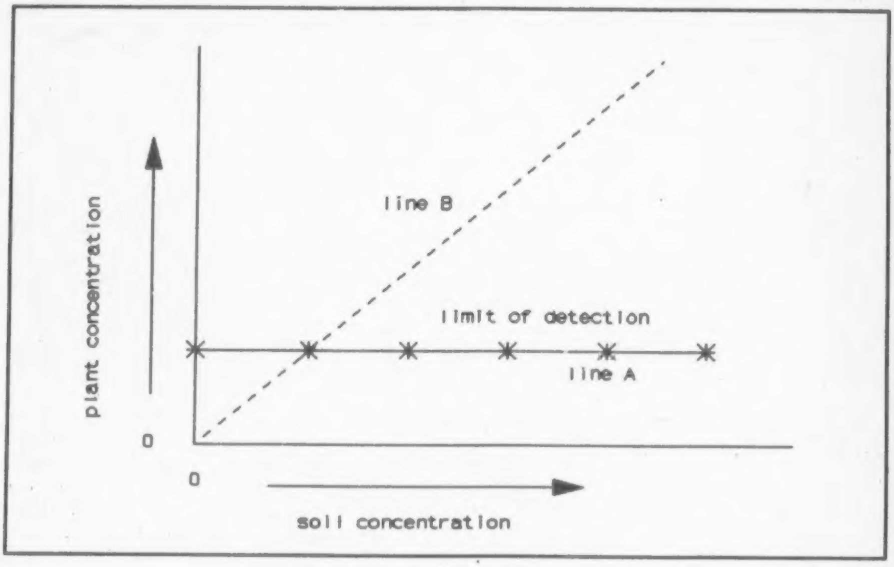

Figure 2. Effect of using different methods to deal with results which are not above the detection limit, and of the zero addition treatment as zero vs. non-detected.

All Chemicals

The Technical Support Document (TSD) lists figures used in the calculations throughout the document. However, it was sometimes difficult for us to locate the numbers for evaluation. Reviews of EPA documents would be facilitated if the final, complete calculation for each pathway and constituent were shown in the TSD, with all units indicated. Reviewers could then follow the calculation method and more easily evaluate impacts of data from reliable field studies.

MEI Discussion (See also Risk Assessment Subgroup Report):

Many of the risk assessment pathways involved a Most Exposed Individual (MEI). Obviously, identification of the ultimate human receptor of the toxicants originating from municipal sludge-amended land is critical. We are, nevertheless, deeply troubled by the MEI used in this risk assessment. The assumptions (life style, diet habit, age, etc.) used to define the target individual do not appear unreasonable when examined separately. When aggregated, however, they produce a purely hypothetical individual. We appreciate EPA's concern to protect all humans. Risk free environmental protection practices, however, do not exist. In public health and environmental protection regulations, the high risk group intended for protection (diabetics, drug addicts, etc.) is clearly identifiable, and risks imposed on them are calculable. We have difficultly identifying any population group which meets all the criteria for Pathway 1F, the garden scenario. It requires the rural farm family to consume 60% of their garden foods grown on a poorly managed (low pH; maximum sludge application) sludge amended soil for 70 years, during which they remain in a metabolic condition which promotes retention of metals and organics in their bodies.

Enacting Rules to protect such hypothetical individuals is scientifically misleading. The stated level of protection is 1 in 10^4 (10^{-4}), but the actual effective level of protection is more likely 10^{-9}.

Critical to the risk assessment models is identification of a MEI for each pathway. Various assumptions are made relative to types of food in diet, amounts of food consumed daily, and, in some cases, the probability of occurrence. In the interest of protection (safety), some of the risk analysis scenarios appear to be extreme, such that we question whether the MEI actually exists in the U.S. population. Further, the MEI definition varies with pathway within a particular sludge use, making comparisons between pathways difficult. MEI also varies across intended sludge uses. The latter variance may be necessary, but consistency in MEI definition within an intended sludge use seems necessary.

Diet Scenarios

Diet scenario inappropriate: For example, one scenario has the farm family consuming 40% of their lifetime meat consumption from livestock exclusively fed crops grown on their own land, all of which was presumed to have been sludge-amended. Data from states with long-term utilization of sludge in agriculture indicate that no more than about one-third of the land in a farm is amended in any one crop year if the farm is large enough to provide all the meat supply of the farm family (D.S. Taylor, personal communication). Thus, a factor of about 1/3 could be incorporated into the annual loading rate calculations. In contrast, the scenario for general agricultural use estimates 0.025% of the diet is impacted, and then multiplies this times a 100-fold safety factor (= 2.5% of diet). In the farm family example, the MEI has a low probability of occurrence. The general population case describes a more reasonable scenario.

Another example deals with constructing artificial trophic scenarios. The lack of specific data for the various soil biota-predator trophic schemes understandably forces EPA to use possibly unconnected biological systems (e.g., ducks eating earthworms.) If such a pathway is found to be critical in regulating applications of a constituent, however, the trophic scheme should be revisited and carefully examined (both for appropriateness, and for availability of alternate data for observed trophic transfers). Data may have to be generated for a trophic transfer appropriate to the pathway if this substitute evaluation becomes a significant limitation in sludge utilization.

Relative effectiveness of dose: In almost all cases, the relative effectiveness of dose has been assumed to be equal to one. Lack of data suggesting otherwise is usually cited as justification for this assumption. A more extensive literature search, however, is necessary to identify the correct RE values. We believe such a search will show RE<1 in most cases. Hinesly et al. (1985) fed female chickens diets formulated from corn grain and soybean meal containing three levels of biologically incorporated Cd. After 80 weeks, the hens retained only 1.3, 0.98, and 0.87% of the total ingested Cd. Similar results were obtained from studies with pheasant (Hinesly et al., 1976) and sows (Hansen and Hinesly, 1979).

Models

There is clear consensus among the peer review committee that models used in several scenarios are inappropriate. More detailed discussion is given in other sections of the report. The land application-agriculture group identified problems with the use of MINTEQ (no adsorption considered), USLE (data suggest poor predictive abilities), and ground water models (too simplistic, many ridiculous assumptions). A general feature of the entire modeling effort is the lack of model documentation available for peer review and use of non-validated models.

OTHER ISSUES

Analytical Methods

New methods: New analytical methods are part of the Proposed rule. Our understanding is that these methods have been tested in the laboratory with aqueous standards. Verification of the method, especially the purported new lower limits of detection (LOD), must be done on sludge matrix samples. We also strongly recommend "round-robin" lab testing of the method to realistically assess method success. Consideration should also be given to the economic impact of the methods on sludge users relative to the real benefit of lower LODs that might result.

- **Limits of detection > regulated application limits:** Some pathways dictate loading rates lower than the limits of detection from existing or new analytical methods. It is unclear how a sludge user is supposed to address this situation.

Limiting Banned Chemicals

The Proposed Rule include limits for chemicals banned by EPA (DDT, chlordane, aldrin/dieldrin, etc.). Some of these chemicals have been banned since the early 1970s. Even if the new National Sludge Survey shows these chemicals to be absent (or more likely, at vanishingly small levels) can we expect the chemicals to be removed from the Rule?

Pathogens or Vector Reduction

In general, the Proposed Rule appear to be adequate based upon current knowledge relating to viruses, bacteria, protozoa and helminths, and vectors. However, there are some other factors that should be considered. Generally, we favor continued use of the present requirements in 40 CFR 257.

Methodology: The presence or absence of viable Ascaris (helminth) ova is used as an indicator of potential pathogen content of sludges. Thus, proper identification and evaluation is critical. No information is given in the Proposed Rule as to the necessity of identifying only viable Ascaris ova. Information should be included to insure that laboratory technicians understand the need for, and will be able to determine the viability of the ova. Ova viability is usually substantially reduced as a result of adequate sludge treatment. Simple observation of ova presence is not enough. "Free-living" soil or plant-living helminths are the most frequently observed helminths in waste water and sludges, but are not a health hazard to man or animals (Fitzgerald, 1982).

Class B treatment concerns: The Proposed Rule for Class B sludges for application to soil suggest Ascaris sp. ova survive for an upper limit of 5 years after their application to control soils. Literature suggests longer survival times of 7+ (Fox et al. 1981) or even 12 years (Krasnonos, 1978). However, no problems have been reported with the present 30 day waiting period before grazing after sludge application, or 18 month waiting period before culture of crops marketed without a process which would reduce pathogens. Both waiting periods are part of the present recommendations of U.S.-EPA, U.S.-FDA, and USDA (1981).

Beef tapeworm: Pathogens such as beef tapeworm (Taenia saginata) are probably adequately controlled, relative to potential human infections, by USDA meat inspection regulations and programs. Thus, the Proposed Rule seem to over-predict danger of tapeworm infection. Potential sources of infection of animals, and eventually humans, exist most commonly as infected recent immigrants. Control of beef tapeworm and other pathogens in sludge can be controlled by heat treatment (composting) and/or time, etc.

SPECIFIC SLUDGE CONSTITUENTS--PATHWAY CONSIDERATIONS

The various constituents of sludge considered in pathways pertinent to Land Application-Agriculture use are addressed in more detail below. Constituents are grouped to facilitate discussion.

Metals: Group I (Cu, Zn, Ni and Cr)

These metals are found in all municipal sludges in the U.S. Whereas their concentrations in sludge vary with the level of industrial waste contribution to POTWs, significant amounts are inherent to domestic wastewater. The agricultural-land sludge utilization assessments reported in the TSD identified inputs of these four metals to be limited by Pathway 7 (sludge→soil→plant).

Phytotoxicities due to Cu, Zn, Ni, and Cr have been reported in the literature. Data documenting phytotoxic responses, however, were primarily generated from studies of metal salts additions in solution culture or pot studies, or used very high metal concentration sludges or metal salt-spiked sludges in pot studies or even occasionally in fields (e.g., Williams, 1980 used sludges containing 11,400 mg Zn/kg or 5100 mg Ni/kg). On the other hand, Cu, Zn, Ni, and Cr toxicities to even very sensitive plants have not been observed in any municipal sludge land application experiment with pH $\geq$ 5.5. Exceptions are when the metals were predominantly inorganic forms (resulting from massive contamination of sludge from industrial sources), or soil pH was << pH 5.5. In fact, plant tissue concentrations of Cu and Cr are rarely affected by sludge applications. Thus, no data are available to directly compute the threshold phytotoxic soil metal concentrations for sludge-amended field soils. Municipal sludge land application experiments have generally not been designed to determine phytotoxic threshold soil concentrations in sludge-amended soils. However, even at relatively high sludge application rates (>100 mt/ha), typical municipal sludges (Cu < 1000, Zn < 2500, Cr < 1000, and Ni < 250 mg metal/kg sludge) have not produced any phytotoxic symptoms, or reduced crop yields (Logan and Chaney, 1983). Further studies of long term high annual rates of application have not produced phytotoxic symptoms (Hinesly et al., 1984).

In the absence of a phytotoxic crop response specifically due to the pollutant being evaluated, the pollutant input and plant tissue pollutant concentration corresponding to the highest No-Adverse-Effect case should be used to calculate the soil phytotoxic threshold from the plant response curve slope. This approach seems the only scientifically justifiable approach.

If the "no-adverse-effect" approach is not acceptable, we propose an alternative approach which has substantially better justification than resorting to metal salt experiments. Determine the plant uptake slope using data for a sensitive plant species (eg. lettuce, snap-bean, etc.) grown under the highest no-negative-effect sludge loading. Based on the calculated uptake slope and phytotoxic foliar concentration derived from field soil experiments which exhibited phytotoxicities from metal salt additions, the phytotoxic threshold concentrations in sludge-amended soils may be estimated. However, in no case should results of metal salt additions to pots of soil in a greenhouse, or solution culture experiments be used to compute metal uptake slopes of plants (see Fig. 1).

Based on this reasoning, we reevaluated parameters used in the TSD to assess potential effects of, and to set limits on, application of Cr, Cu, Ni, and Zn in Pathway 7. The correction of parameters in one pathway often led to readjustments in other pathways, and a change in the limiting pathway for a given pollutant. We then evaluated the next most limiting pathways, element by element, until all necessary adjustments for that element were completed, or until the cumulative application rate for a median quality sludge approached or exceeded 1000 mt/ha.

Copper

Pathway 7 (sludge→soil→plant): The TSD assessment selected 42 µg Cu/g soil as the soil's phytotoxic threshold concentration (RLC) and 0.15 µg Cu/g plant shoot DW·[mg/kg soil DW]$^{-1}$ as the plant's uptake slope. Both parameters were derived from studies of metal salt additions to sludge-treated soils (MacLean and Dekker, 1978).

The reviewers are familiar with many attempted studies of the toxicity of sludge-applied Cu. Addition of inorganic Cu salt to light textured, low organic matter soils has caused phytotoxicity in the field. However, as summarized by Webber, et al. (1981), sludge-applied Cu did not cause phytotoxicity at any cumulative application rate. Copper is very strongly adsorbed by sludge constituents such as humic acid and hydrous Fe oxide, and the toxicity of sludge-applied Cu is very dependent on the concentration of Cu in the sludge rather than the Cu application rate. Plant uptake of sludge-applied Cu has been observed to fit the plateau response model in many field studies (e.g., Chaney et al., 1982; Bell et al., 1988). Based on these data, and the wealth of field-sludge research showing "no-adverse-effect" of sludge Cu, it seems clear that the best approach for protecting against potential phytotoxicity of sludge-applied Cu is to regulate sludge Cu concentration, or to impose cumulative soil Cu limits only for sludges with excessive Cu concentration.

An alternative approach to that of the TSD is to use field data on Cu uptake by leafy vegetables, coupled with independent data which indicate the maximum Cu concentration in plants before significant yield reduction occurs. If the data from a field experiment are used to compute these two parameters (Dowdy, et al., 1978), an uptake slope of (0.050 µg Cu/g plant DW)·[mg Cu/kg soil DW]$^{-1}$ results. [Note: This uptake slope was calculated from data presented in the original publication. These data (Dowdy, et al., 1978) are incorrectly entered in Table 4-51, page 4-296, of the TSD. The next to last line of Table 4-51 on page 4-296 should be corrected to read, left to right by column: Snap bean/edible; sludge (field); 5.3-5.8, 2.9-5.8; NR; 85.5; 4.2-10.0; increased yield; Dowdy, et al., 1978 (p. 255). The last line of Table 4-51 on page 4-296 should be corrected to read, left to right by column: Snap beans/leaf; sludge (field); 5.3-6.5; 4.5-7.5; NR; 85.5; 8.5-12.0; increased yield; ibid.] As no phytotoxicity was observed in this case (Dowdy et al., 1978), we proceeded to estimate the soil-Cu phytotoxic threshold concentration by assuming the foliar concentration of Cu to be 10 µg Cu/g for normal plants, and 40 µg Cu/g for plants

suffering Cu-phytotoxicity, respectively (Walsh et al, 1972). The RLC will then be estimated by using the slope of crop uptake of soil Cu:
(40-10 mg Cu/kg leaf DW)·[(0.05 mg Cu/kg leaf DW)·(mg Cu/kg soil)]$^{-1}$ =
30 ÷ 0.05 = 600 mg sludge-Cu/kg soil.

Excessive Cu applications have been found to prevent nitrification of ammonia at Cu levels below those which affect nitrogen mineralization or plant growth (Minnich and McBride, 1986). It is not clear whether this is a significant environmental effect of Cu which should be the basis for this Rule. Nitrification potential does not reduce yields in practice.

Substituting 600 mg Cu/kg soil for 42 mg/kg in equation 36 [page 4-305] results in a reference cumulative application rate of Cu: RPC = [(600-19) mg Cu/kg soil]·[2000 mt soil/ha]·[10^{-3} kg/mt] = 581·2 = 1162 kg Cu/ha (this assumes 1.33 bulk density) which is substantially higher than the value derived in the TSD (46 kg Cu/ha). If the median sludge Cu concentration is about 500 mg/kg, the TSD limit would allow 92 mt sludge/ha. With a limit of 1162 kg Cu/ha, 2324 mt/ha of median quality sludge could be applied before reaching the Cu limit. This was a very significant error, and would cause sludge application on cropland to be impractical for most cities. [Note: Scientists at the University of Illinois (Hinesly et al., 1984) applied > 700 kg sludge-Cu/ha with no observable phytoxicities.]

The Pathway 7 limit would be still higher if EPA chose to base this limitation on data from studies with low Cu sludges which caused no phytotoxicity to sensitive crops in strongly acidic sludge-amended soils (Chaney et al., 1982; Logan and Chaney, 1983).

Pathway 5 (sludge→soil→plant→animal): The readjustment of the two parameters in Pathway 7 shifted the limiting pathway of Cu to Pathway 5. According to the TSD [page 4-230], the plant uptake slope for wheat forage grown on sludge-amended field plots was 0.15 μg Cu/g plant DW·[kg Cu/ha]$^{-1}$; data derived from Shaeffer et al. (1979b). However, data tabulated in Table 4-44 [page 4-237] where the uptake slope according to Shaeffer et al. (1979b) was referenced, contains important scientific errors. In one error, the TSD records DTPA extractable Cu application, rather that the total Cu application for this experiment. The sludge contained 2200 mg Cu/kg DW, and was applied at 112 mt/ha at the start of the study resulting in 246 kg Cu/ha, not the 58 kg noted in Table 4-44. The correctly calculated slope is then (3.7-2.1)÷(246-13.0) = 0.007 (mg Cu/kg plant DW)·[kg Cu/ha soil]$^{-1}$. Data on sludge composition and control soil analysis (4.9 mg Cu/kg = 13 kg/ha) were reported in the companion paper (Sheaffer et al., 1979a). The TSD reported that the slope was 0.3 in Table 4-44, but used a slope of 0.15 on page 4-230 without explanation. Even using the data in Table 4-44 leads to a calculated slope of (3.7-2.1)÷[(58-0.6)·(2000 mt soil/ha)·(1000 kg/mt)$^{-1}$(to convert mg/kg to kg/ha)] = 0.056 (mg Cu/kg forage DW)·[kg Cu/ha]$^{-1}$, not 0.3 or 0.15. We also calculated the uptake slope using the third year corn silage data (Dowdy et al., 1983) (5.3-4.2)·[126.7 kg sludge-applied Cu/ha minus control of approximately 20 kg Cu/ha]$^{-1}$ = 1.1/106.7 = 0.010 μg Cu/g silage DW·[kg Cu/ha]$^{-1}$. If one uses this typical Cu uptake response (0.010) of forage crops grown ≥ 1 year after sludge is applied, the maximum allowable pollutant loading rate using the diet maximum Cu from the TSD (25 mg Cu/kg) is (25-2.1)·[0.010]$^{-1}$ = 2390 kg Cu/ha. This value is considerably greater than the

153 kg Cu/ha value in the Proposed Rule and TSD. Correction of the estimated maximum safe sludge-applied Cu which protects livestock, shifted the limiting pathway of Cu to Pathway 8.

In the course of our evaluation, we also found that the data used to derive feed concentration toxic to herbivorous animal (TA_H = 25 μg/g DW) were from an experiment where Cu salts were fed to Zn-deficient sheep. Because of the increased Zn concentration in forages grown on sludge-amended soils, forage grown on sludge-treated soil will not be deficient in Zn and should not allow any deficiency in animals foraging on this type of feed. Also, the potential toxicity of inorganic salts is invariably greater than the same element present in plant tissue. For these reasons, we feel the value of TA_H should be substantially greater than 25. We did not have time to investigate and recommend an appropriate substitute. The EPA should consider data noted by Chaney et al. (1987) for sheep grazing pastures treated with swine manure containing high levels of Cu, but which did not induce Cu toxicity. See also Baker (1974) for a discussion of Cu-Mo interactions in swine. Data from Bray et al., (1985), Dowdy et al., (1983a, b) and Dowdy et al., (1984) should be considered in all pathways considering sludge→soil→plant→animal. These data are from goat and sheep feeding studies where corn silage grown on sludge-amended soil constituted >90% of the animal diet. Silage contained elevated levels of Cd, Cu and Zn.

Pathway 8 (sludge→soil→soil biota): In Pathway 8, Cu is the only element listed in Table 6-3 of the TSD. Soil biota may be susceptible to toxic effects of many constituents in the sludge, but only Cu was identified in the risk evaluation.

In this exercise, EPA used the data of Ma (1984) to derive the soil concentration of pollutant toxic to soil biota (TB = 131 μg/g DW) and arrived at a maximum allowable pollutant loading of 224 kg/ha Cu. The experiment of Ma (1984) was conducted at soil pH 4.8, and with $CuCl_2$ added to produce a soil Cu concentration of 131 μg/g. These experimental conditions clearly do not simulate soil chemical conditions of sludge-treated agricultural soils.

Hartenstein et al. (1980) cultured earthworms in municipal sludge whose Cu contents ranged from 380-610 μg/g. They reported no detrimental effects of this species of earthworm even when grown in 100% sludge. If the earthworms are able to tolerate 380-610 μg Cu/g in undiluted municipal sludge [a far more relevant example than Ma (1984)], they should be able to withstand 380-610 μg Cu/g in sludge-amended soils. Substituting 380-610 μg/g Cu for 131 μg/g in the computation results in a considerably higher maximum allowable pollutant loading under this pathway. Using 380 mg Cu/kg leads to the new limit of $(380-10)\cdot 2000\cdot 1000^{-1}$ = 740 kg Cu/ha. Similarly, $(610-10)\cdot 2$ = 1200 kg Cu/ha. Thus, the TSD value of 244 is increased by 3 to 5 fold. The highest no-adverse-effect level would be the 1200 kg Cu/ha. They noted other "no-adverse-effect" studies with this earthworm at 1500 mg Cu/kg sludge.

Pathway 6 (sludge→soil→animal): Adoption of the above corrections leaves Pathway 6 as the limiting pathway for Cu. In this simple and straight-forward pathway, threshold feed concentration and the fraction of the diet that is adhering soil or sludge are needed to estimate the reference application rate of pollutants.

The source of the threshold feed concentration (TA = 25 µg/g D.W.) was the same (metal salt study) as used in Pathway 5. However, the bioavailability of the sludge-borne Cu in sludges ingested by cattle and sheep has been shown to be significantly lower than that of inorganic Cu salts (Chaney et al., 1987). Further, the "most sensitive" Zn-deficient foraging animals are very unlikely to occur if they graze sludge-fertilized pastures. Thus, TA could be increased by 2-4 fold based on sludge-grazing and sludge-feeding studies(Fitzgerald, 1978, 1980, 1982; Smith et al., 1985). Clearly, sludges containing 1000 mg Cu/kg DW have not caused substantial increase in liver Cu, while very high Cu sludges have caused increased liver Cu. We believe that the best way to avoid Cu risk to livestock from ingested sludges or soil-sludge mixtures is to require injection or tilling of sludges containing over 1000 mg Cu/kg (or higher after review of the complete literature on sludge feeding) into soils before allowing grazing. Alternatively, once a new TA is determined, the maximum allowable pollutant input under this pathway can be recalculated.

The fraction of diet of grazing livestock that is adhering sludge is approximately 2.5%, not 10% (Chaney et al., 1987). Based on season-long analyses of feces to estimate sludge ingestion (whole season data are more appropriate than single highest result because prolonged chronic exposure is required before liver Cu is raised to injurious levels), the average intake of sludge from pastures which received surface applied liquid sludge or compost was 2.5% of dry diet. Surface applied sludge represents a much greater potential ingestion of sludge than would sludge mixed well with the surface 15 cm of soil as used in the TSD. Replacing the FL used on page 4-275 (10%) with 2.5% we calculate RLC $= (98_{RFC}/0.025_{FL}) + 10_{BS} = 3930$. However, as noted above, we believe research has shown that sludges containing > 1000 mg Cu/kg DW should be injected below the soil surface or mixed with the plow layer soil to minimize potential risk to grazing livestock. These practices would prevent any risk from this pathway.

Comparison of Estimated Sludge-Cu Application Limits.

Pathway	TSD Limit	Corrected Limit
	---Maximum allowed kg Cu/ha---	
5:Sludge→Soil→Plant→Animal	153	at least 2390
6:Sludge→Soil→Animal	458	3930
7:Sludge→Soil→Plant	46	1160
8:Sludge→Soil→Soil Biota	224	1200

Zinc

The risk assessment for sludge-applied-Zn in the TSD contained similar deficiencies as those described above in our review of the TSD analysis for Cu risks. These include:

1. Determination of the plant's pollutant uptake slope and the soil's phytotoxic threshold concentrations from data derived from inappropriate experiments.

2. Food chain and/or trophic level was not properly considered in the selection of soil-biota predator, and

3. Assumptions on consuming 100% contaminated diet and of 100% relative effectiveness of ingestion exposure.

Pathway 7 (sludge→soil→plant): In this pathway, the reference soil concentration of pollutant (RLC) = 140 µg/g was calculated from data in MacLean and Dekker (1978). This study added inorganic Zn salts to controls and sludge-amended soils in a greenhouse-pot study of lettuce grown at several soil pH levels. In our opinion, this set of data is not appropriate for estimating sludge-Zn application limits. An alternate source of appropriate published Zn data have been presented by Dowdy, et al. (1978) for snap beans. These data are from field studies with sewage sludge and should be included in Table 4-54 on page 4-330 of TSD to read from left to right by column: Snap bean/edible; sludge (field); 5.3-5.8; 26-36, NR; 486; 34-46; increased yield; Dowdy, et al., 1978 (p. 255). A second additional entry for this table, from left to right by columns: Snap beans/leaf; sludge (field); 5.3-6.5; 26-30; NR; 486; 42-51; increased yield; ibid. (p. 256).

Based on additional field data (Table 1), the Zn uptake slope for lettuce expressed as plant concentration (µg Zn/g DW) per unit of sludge-Zn applied (kg/ha) is 0.134 (µg Zn/g)·[kg Zn/ha]$^{-1}$. This calculation of slope ignores a separate analysis which showed that foliar Zn approached a plateau with increasing sludge Zn application rate.

If the phytotoxic foliar Zn concentration in lettuce is 500 µg/g (for 25% yield reduction) or 400 µg/g (for first detectable yield reduction) (Logan & Chaney, 1983), the RLC for Zn may be calculated:

$$\begin{aligned} \text{RLC} &= (400\text{-}32\ \mu\text{g Zn/g DW})\cdot[(0.13\mu\text{g Zn/g DW})\cdot[\text{kg/ha}]^{-1}] \\ &= 368/0.13 = 2750\ \text{kg sludge-Zn/ha.} \end{aligned}$$

Experiments at the University of Illinois (Hinesly, 1984) applied sludge-Zn at 2400 kg Zn/ha with no observable effects on plant yields. Further, Mahler et al., (1982) found no yield reductions in pot studies with Swiss chard or corn at soil Zn levels of 1760 mg Zn/kg.

Table 1. Concentrations of metals in lettuce and soil as affected by sewage sludge application [1,2]

Sludge Appl.	Soil pH	Lettuce[3]			Sludge-applied M^{2+}		
		Ni	Cu	Zn	Ni	Cu	Zn
(mt/ha)		------µg/g DW-------			------kg/ha DW-----		
0	6.7	0.54 a	6.8 c	32 a	0.	0.	0.
56	6.5	1.29 b	8.9 ab	58 b	9.5	123.	246.
112	6.1	2.41 c	8.6 b	98 c	19.	246.	493.
Slope[4]					0.098	0.0073	0.13

[1] Personal Communication (Chaney, R.L., A.M. Decker, and C.C. Shaeffer, 1980, unpublished data).

[2] No effect on yields, field study, Beltsville silt loam, 6th year following sludge application. Study used a sludge with high Zn concentration, 4400 mg Zn/kg, which would cause relatively higher Zn uptake that equal amounts of Zn added in a median quality sludge. The background soil Zn = 31, soil Ni = 10., and soil Cu = 4.9 mg/kg D.W.

[3] Means within columns followed by the same letter are not significantly different at 5% level.

[4] Slope units are: (mg metal/kg leaf DW)·[kg metal/ha]$^{-1}$

Pathway 9 (sludge→soil→soil-biota→predator): The above calculations would shift the pathway limiting cumulative sludge-Zn applications to Pathway 9. In this case, we examined the data used for computing the input parameters (e.g. UB = 2.95 (mg/kg)·[kg/ha]$^{-1}$, BB = 228 mg/kg, and TA = 894 mg/kg). All were close to generally recognized values, and we propose no major changes. However, we note an omission of data from Helmke et al. (1979). This paper is one of the best ever published on metal uptake by earthworms from sludge-amended soils. The species examined in this study were Lumbricidae, the species usually considered "earthworms" in farmer's fields. In their Figure 2, the slope of earthworm body Zn concentration (corrected for soil contamination) vs. sludge applied Zn (15 mt/ha = 51 kg Zn/ha, 30 mt/ha = 102 kg Zn/ha, and 60 mt/ha = 204 kg Zn/ha) is about 1.0 mg Zn/kg earthworm·[kg sludge-Zn/ha]$^{-1}$. Beyer et al., (1982) examined long-term sludge farms, and found an average Zn-uptake slope for five cities of 3.25, with BB = 227 mg Zn/kg; the TSD cites data for four cities with an uptake slope of 2.95.

The selection of representative species of the trophic level/food chain was less than desirable. Earthworm was selected as representative of the soil biota. Japanese quail, however, is not likely to be the species representative of the next trophic level, and the other bird species listed tolerated considerably higher Zn levels. We do not believe it is ecologically sound to assume a mismatched food chain when one evaluates the transfer of toxicants to higher trophic levels. The current risk assessment scenario assumes that 100% of the predator's food intake is derived from contaminated soil biota. Nelson Beyer of U.S. National Wildlife Research Center (personal communication) indicated that, at most, one-third of a predator's diet can be attributed to earthworms in periods of maximal earthworm consumption. Thus, we feel the current risk assessment overestimates the exposure and undercalculates the maximum allowable pollutant loading for this pathway. This deficiency applies to all pollutants being evaluated under this pathway.

Earthworms, including soil in the gut of the worm, are ingested whole by birds. This soil provides both exposure and Zn-adsorption capacity to reduce Zn absorption by the bird ingesting the earthworm. Even Zn in foods is not as bioavailable as the Zn salts fed in the animal toxicity tests used to generate the Zn tolerance estimate, TA (Bremner, 1970).

The allowed soil concentration of the pollutant = $[(894-228)(2.95)^{-1}]$ + background soil Zn = (666/2.95) + BS = 226 + BS. The 226 value should be divided by 0.33 (33% of predator's diet attributed to earthworms and 0.50 estimated 50% bioavailability of Zn in sludge-soil mixture). Using the adjustment factor of 0.50·0.333 = 0.167, we obtain 226/0.167 = 1353 mg Zn/kg. A lower estimate of Relative Effectiveness would have increased the allowed Zn application even more. Correction for background soil Zn gives 1353-54 =1299 mg Zn/kg allowed sludge-applied-Zn. This is converted to kg/ha: (1299 mg Zn/kg)·(2000 mt soil/ha·15 cm)·$(1000\ kg/mt)^{-1}$ = 2600 kg Zn/ha compared to the TSD estimate of 452.

However, no Zn toxicity has ever been reported for ingested sludge or soil in sludge grazing or sludge feeding studies. This pathway is now the most limiting pathway for Zn application, and a more thorough assessment is needed to accurately set Zn limits.

Comparison of Estimated Sludge-Zn Applications Limits:

Pathway	TSD Limit	Corrected Limit
	---Maximum allowed kg Zn/ha---	
7:Sludge→Soil→Plant	172	2750
9:Sludge→Soil→Soil Biota	452	≥2600

Nickel

Only three pathways were reported for Ni in Table 6-3 (TSD). These include Pathway 1, 5340 kg Ni/ha; Pathway 1F, 206 kg Ni/ha, and Pathway 7, 78 kg Ni/ha.

Pathway 7 (sludge→soil→plant): The reference soil concentration of Ni (RLC = 57 μg/g D.W.) was calculated from MacLean and Dekker (1978) whose experimental treatments consisted of metal salt and metal salt-spiked sludges. Using the more appropriate Ni data of Table 1, we were able to calculate the plant (lettuce) pollutant uptake slope (0.098 (μg/g)·$[\text{kg sludge-Ni/ha}]^{-1}$) and used it to back calculate the reference soil concentration of Ni. We also assumed initial phytotoxicity to sensitive crops occurred when foliar Ni concentration reached 50 μg/g DW (Logan and Chaney, 1983).

RLC = (50 mg Ni/kg leaf DW)·[0.098 (mg Ni/kg leaf DW)/[kg sludge-Ni/ha]$^{-1}$ = 500 kg Ni/ha = RPC.

Pathway 1F (sludge→soil→plant→human): The adjustment of the reference soil concentration of Ni as demonstrated above shifts the limiting pathway for Ni to Pathway IF at 206 kg/ha.

However, we question the toxicity risk to humans indicated in the TSD. We are aware of data from feeding sludge-grown crops which tested the effect of Ni level in the food on the growth of voles (Alexander et al., 1979). In this work, the grain of soybean was harvested from plants which suffered a significant yield reduction on acidified field plots amended with a sludge compost containing admixed serpentine rock chips. Upon acidification of the plots, the crops took up much more Ni than at the original pH levels. Grain reached 30 mg Ni/kg. However, no negative effects were observed in the voles fed the grain.

Many livestock feeding studies have shown that animals tolerate much more Ni than would appear to be the case for humans based on EPA extrapolation of a long term feeding study with rats. EPA set the RfD at 20 µg/kg/d = 1400 µg Ni/d for adult males. Based on the review of Ni in human and animal nutrition by Nielsen (1987), we doubt that this RfD has much relevance to human Ni risk. This would be 1400 µg Ni/500 g food = only 2.8 mg Ni/kg food DW. Plants generally tolerate foliar Ni levels of ≤ 100 mg/kg DW. Essentially all grain, fruit, and tuber crops have lower Ni in the storage tissues than in the leaves. If the human tolerates only 2.8 mg Ni/kg dry diet, and crops tolerate as much as 50-100 mg Ni/kg DW (chlorotic symptoms apparent by about 50 mg Ni/kg), perhaps some limit is necessary. However, many studies have shown that Ni in test foods caused no toxicity (Alexander et al., 1979; Chaney et al., 1978a, 1978b)

Thus, we feel the use of the RfD derived from soluble salt feeding studies with rats in the TSD is inappropriate for protecting humans from sludge-applied Ni. Food affects the bioavailability of ingested Ni, as well as many other nutrients. In our judgement, there is clear evidence that protection of crop production (phytotoxicity) completely protects the food chain. Thus, no limitation is needed under Pathway 1 or 1F.

Comparison of Estimated Sludge-Ni Application Limits.

Pathway	TSD Limit	Corrected Limit
	---Maximum allowed kg Ni/ha---	
7:Sludge→Soil→Plant	78	500
1F:Sludge→Soil→Plant→Animal	206	>>500

Chromium

Pathway 7 (sludge→soil→plant): The TSD reports that chromium limits sludge application only under Pathway 7, with a limit of 530 kg Cr/ha. However, we are familiar with much data which leads us to conclude that the TSD analysis is not valid for this element. The reference soil concentration of Cr (RLC = 200 µg/g) was obtained from a field study of snapbeans grown on soils treated with hexavalent chromium in the form of potassium chromate. (CAST, 1976; Mortvedt and Giordano, 1975). The TSD, nevertheless, ignored the authors' observation that an equal amount of Cr applied in composted (municipal waste + sludge) had no phytotoxic effect. Hexavalent chromium is more soluble and more bioavailable for plant uptake than the trivalent chromium usually found in sludges and field soils. [Chromium can be oxidized to the hexavalent state by soil MnO_2 (Bartlett and James, 1979) but exists at low concentrations.] Thus, the Mortvedt and Giordano (1975) data from chromate additions should not be used to derive a valid RLC for Cr in sludge-treated soil. Further, on page 4-295, a background soil Cr of 100 mg/kg is used. Most soils contain only 50 mg Cr/kg based on the U.S. Geologic Survey analysis of over 3000 samples from across the U.S. (Shacklette and Boerngen, 1984).

Chromium phytotoxicity is manifested as reduced root vigor without corresponding large increases in leaf Cr concentration. In a comprehensive review of observed effects of sludge-applied Cr for the European Economic Community, Williams (1988) indicated that Cr phytotoxicity had never been observed in sewage sludge-amended soils. One short term study of a tannery sludge (containing 32% Cr) observed phytotoxicity, but we consider these data non-relevant in estimating limits on municipal sludge-Cr application. Dowdy et al. (1983b) observed no yield reduction in corn silage with applications of 1790 kg of Cr/ha. Associated tissue Cr concentrations were 0.9 µg/g and 0.9 µg/g for control and sludge treatment, respectively.

Another example of the non-toxicity and non-plant-uptake of Cr is found in studies of plants grown on serpentine soils. The parent rocks of serpentine soils may contain high levels of Cr, and such soils naturally contain Cr levels as high as 1% Cr (10,000 mg Cr/kg). However, plants growing on these soils do not exhibit Cr-phytotoxicity. Recently, Cary et al. (1989) reported Cr concentrations in plants grown on serpentine soils. They used a new technique to correct for soil contamination of the plant sample because even a slight contamination can cause more Cr to appear in the plant sample than is truly taken up by the plants. Their analyses showed that soil contamination could account for all the Cr found in any of their plant samples, even those growing on soil containing 11,000 mg Cr/kg. All previous studies of Cr uptake from Cr-rich soils must be suspect in light of the Cary et al. findings.

Based on these considerations, we conclude that there is no scientific basis to limit application of sewage sludge-Cr based on phytotoxicity. Similarly, there is no known basis to limit sludge-Cr to protect the food chain (Pathways 1, 1F), livestock or children from Cr-toxicity due to sludge ingestion, or soil biota or wildlife.

Pathway 12 (sludge→soil→groundwater→human): There are data which indicate that freshly added Cr^{3+} can be oxidized to chromate in some soils high in MnO_2 (Bartlett and James, 1979). Thus, there has been some concern about formation of chromate which could then leach to groundwater at concentrations above the drinking water standard of 0.05 mg Cr^{6+}/L. No data are available from sludge research studies, or from serpentine soils with 10,000 mg Cr/kg, that Cr^{3+} in surface soils is actually leached to groundwater in amounts violating the drinking water standard (Chaney, 1983).

Some scientists (Baker et al., 1985) feel that there should be a limit on Cr in sewage sludges applied on agricultural land, despite the lack of a technical basis for estimating a limit based on environmental protection. Generally, sludges containing over 500 mg Cr/kg have identifiable industrial inputs. Several groups recommend that land-applied sludges be limited to 1000 mg Cr/kg (Baker et al., 1985). However, sludges with over 5000 mg Cr/kg DW have been used in long-term sludge research studies with no significant negative effects compared to otherwise low metal sludge (Bidwell and Dowdy, 1987). We have no specific recommendation about sludge Cr limits, or sludge-Cr application limits because we can identify no scientific basis to estimate such limits.

Comparison of Estimated Sludge-Cr Application Limits.

Pathway	TSD Limit	Corrected Limit
	---Maximum allowed kg Ni/ha---	
7:Sludge→Soil→Plant	530	No basis
12:Sludge→Soil→Groundwater→human		No basis

Metals: Group II (Pb, Cd, As, Se, Mo, Hg):

Chemically and geochemically, Pb, Cd, As, Se, Mo and Hg are dissimilar elements. The mechanisms and environmental transport pathways that bring them to municipal sludges are also dissimilar. We grouped them together for discussion because they all can be toxic to humans and/or animals.

The risk assessment pathways for these elements involved an exposure scenario leading to a MEI. The MEI is so rigidly defined in the risk assessment exercise for agricultural land disposal that it becomes the driving force of the criteria setting. It completely overshadows other components of the risk assessment pathways even to the extent that it makes the issue of "inappropriate" technical parameter data almost irrevelant. Accordingly, we had difficulty directing our focus. The Sludge Application-Agricultural Land group proposed alterative MEIs where we were familiar with the data. The issue of a reasonable MEI must be resolved if the maximum allowable pollutant loadings as proposed for these elements are to be justified.

The remaining text assumes the concept of MEI as defined by EPA. We reviewed pathways for the Group II metals individually.

Lead

The TSD indicates that application of lead in sludge would be most limited by Pathway 9 (the toxicity of earthworm-Pb to birds), at 125 kg Pb/ha. The next most limiting pathways were 1F at 195 kg/ha, and Pathway 2F at 378 kg Pb/ha. The results calculated for Pb in Pathway 7 were not listed in Table 6-3 of the TSD.

Other parts of this report discuss errors in the daily sludge/soil ingestion value, and suggest that at least 0.5 g soil/day should be used. However, the TSD omits information about the bioavailability of Pb. Chaney et al. (1989) provide a detailed review of the available information on bioavailability of soil Pb. Sludge Fe and organic matter provide high ability to adsorb Pb in sludge and reduce its bioavailability.

Pathway 9 (sludge→soil→soil-biota→predator): Pathway 9 calculations also suffer from a lack of consideration of bioavailability of food-Pb. Water-borne soluble Pb salts have high bioavailability, with as much as 80% absorption of salt Pb by fasting humans. However, consumption of salt Pb with food lowers the retention to about 5% (James et al., 1985). Because earthworms are ingested with soil in their guts, the soil present can also adsorb Pb, lowering the bioavailability of earthworm-Pb substantially. Thus, the limit for Pathway 9 should be well above 1000 kg/ha, far higher than is safe for children who ingest soil (the limitation due to Pathway 2F).

The TSD relied on data from Pietz et al., (1983) when data from Beyer et al. (1982) provide a wider assessment of earthworm Pb accumulation from sludge-amended soils. [Soil analysis for the Pietz et al. plots failed to demonstrate that sludge metals remained in the plot soils. The metals may not have been present to expose the earthworms]. The effect of sludge on earthworm Pb concentration was significant, but very small (Beyer et al., 1982).

Perhaps the most serious error in the Pathway 9 assessment is the misuse of data from Coburn et al. (1951) to estimate the tolerance of dietary Pb by birds. Coburn et al. fed Pb salts to captured Mallard ducks on a mg Pb/kg body weight basis. The TSD used these data as if they were mg/kg diet basis, a significant error. Adult ducks chronically fed 6 mg Pb/kg body weight/day exhibited no toxicity, but a 12 mg/kg·day rate was quite toxic. The birds weighed approximately 1 kg each, and this weight bird consumes about 100 g dry diet/day. Thus, 6 mg Pb per day/0.10 kg diet per day = about 60 mg Pb/kg diet. (EPA attempted to make this conversion, but used food intakes for baby chickens rather than intakes of adult ducks). However, the Pb was administered as a solution of $Pb(NO_3)_2$ by a catheter directly into the gizzard once per day. This form of dose administration prevents food constituents (fiber, Ca, P, phytate, etc.) from binding much of the dose. In fact, the dose was meant to simulate the effect of ingesting Pb shot.

The errors noted above are confounded, because the errors in dose calculation, in food-Pb bioavailability, and in earthworm uptake of Pb from sludge-amended soils are multiplied together. The correct estimates should have been: (60 mg Pb/kg diet)·10(RE Pb in water/RE Pb in food) = 600 mg Pb/kg diet.

With the small slope of earthworm uptake of sludge-Pb from sludge-amended soil, it is likely that the most important exposure would be the fraction of soil inside the earthworms that are ingested. If one assumes 10% soil in earthworm dose, the slope would be higher than for the earthworm:soil slope reported for Beyer et al. (1982). The background Pb concentration in the control earthworms of Beyer et al. (1982) was 18 mg Pb/kg, whereas the worms from sludge-amended soils contained 21 mg/kg; the soils contained 24 mg Pb/kg (control) and 32 Pb mg/kg (sludge-amended). The small increase in soil Pb due to sludge application, and small increase in worm Pb, make this a weak test of the slope of earthworm response to sludge-applied Pb. The threshold toxic feed concentration (TA) is taken as 60 mg Pb/kg, but many animals tolerate this level without health effects if it is supplied with food (NAS, 1980).

From the TSD, the RLC = [(TA - BB)÷UB] + BS. Elsewhere we have noted the need to incorporate a RE in this equation, as well as a fraction of earthworms in the birds diet (33%). Because of the effect of food and of soil on Pb bioavailability, a RE of 0.10 for earthworm Pb seems reasonable. The revised equation using a TA from food Pb is RLC = [(TA - BB)÷(UB)÷(RE)÷(fraction of diet)] + BS = [(60 -18)÷(0.10 RE for soil vs. food Pb)] ÷ (0.33 fraction of diet) ÷ (3.2 mg increased earthworm-Pb on sludge-amended plots with 8.5 mg increased Pb/kg soil) = 420 ÷ (0.33)(0.38) = 3349 mg Pb/kg soil. Other data (Morgan and Morgan, 1988) indicate that the uptake slope is much lower than 0.38 mg (increased earthworm tissue Pb)$\cdot$[increased mg Pb/kg soil]$^{-1}$. Slope for earthworm Pb vs soil total Pb for worms inhabiting metal mine wastes was $\log_{10}\text{Pb}_{\text{worm}} = -1.073 + 1.042\log_{10}\text{Pb}_{\text{soil}}$. For soil Pb = 1000 mg/kg, this calculation yields earthworm body Pb = 113 mg/kg. Alternatively, we can assume 10% soil in the live earthworms, and work backwards: 3349 mg Pb/kg soil x 10% soil in diet = 335 mg Pb/kg whole worms; consumption of 33% worms in diet dry matter gives an exposure of 112 mg Pb/kg diet. The soil Pb would have bioavailability of about 25% of food Pb (at 3350 mg Pb/kg soil), so the equivalent food Pb dose would be about 28 mg Pb/kg diet, a clearly non toxic dose. There are so many corrections to the data, and changes to the calculation method, that we will not estimate a soil Pb limit for Pathway 9 other than to say ≥ 1000 kg/ha (= 500 mg/kg soil). However, it is clear that this limit is about 10 fold greater than the limit for Pathway 2F (the generally accepted limiting pathway).

Pathway 7 (sludge→soil→plant): The TSD omitted Pathway 7 from the summary Table 6-3, but the calculations are shown starting on page 4-305. The report of Giordano et al. (1979) did not find any evidence of Pb phytotoxicity. The Demayo et al. (1980) reference is a review paper, but is ignored because "the source of the Pb in the most sensitive case they discuss is not reported". We feel this is a poor reason to ignore the paper if the original source were obtained and shown relevant to regulating sludge applications. The W-170 committee is not aware of any data that sludge-Pb caused phytotoxicity in crops. Only salt additions have caused Pb toxicity, and then the conditions were so artificial that no specific Pb phytotoxicity could be alleged. The TSD concludes "Because no sludge studies were available in which lead levels were high enough to cause phytotoxicity, calculating the reference soil concentration is not possible." We agree with this conclusion.

Pathway 2F (sludge→soil→human): The consideration of Pathway 2F will be considered separately for D&M vs. Land Application-Agriculture because Pb in sewage sludge ingested by animals has proved to have low bioavailability. **Pathway 2F-D&M** should be the most important limitation on sludge Pb for D&M sludge materials, because one must assume that the materials remain on the soil surface in some exposure cases. However, for agricultural utilization, **Pathway 2F-Agricultural Land** must consider that sludge has been well mixed in the plow layer soil. Pb health effects on growing infants are much more prevalent than for adult males, and this is widely recognized in the scientific community (ATSDR Report to Congress, 1989). EPA has major research efforts underway to further assess and prevent this risk to U.S. children. Thus the critical importance of Pathway 2F in Pb risk is obvious.

In the TSD, EPA indicates that the RIA = 20 μg Pb/day, and the background soil Pb (BS) = 11 mg/kg. The loss rate is 0, as no process for volatilization of Pb from soils has been identified. The use of 0 mg Pb/day total background intake rate (TBI_t), however, is not justified.

Much of the Pb risk assessment discussion is unjustified. On page 4-55 of the TSD, EPA notes that children absorb more Pb from food than do adults, but suggests that children are less exposed to crops grown on sludge-treated soil. However, the food ingestion per unit body weight is much higher for growing children than for adults (at least 4-8 fold, depending on age). The problem with children vs adult males is that after one takes into account the log-normal distribution of blood Pb, and high intake/kg body weight for children, the present background level of blood Pb in urban children often exceeds the desired maximum level to avoid health effects. If part of the normal population exceeds the blood Pb associated with adverse Pb-health effects, no additional exposure to Pb (from D&M of sludge products or any source) should be allowed. On the other hand, part of the exposure of inner-city children (besides from paint, food, automotive emissions, and water) is Pb from historically polluted urban soils. The surface few centimeters of urban soil averages over 1000 mg Pb/kg in the inner city of most large cities (Chaney et al., 1989; ATSDR, 1989). Pb levels in house dust may be higher or lower depending on sources. Land application of sludge products may actually reduce both the concentration of Pb in urban soils (dilution) and the bioavailability of Pb in the mixed soil (adsorption). The principle consideration should be whether ingested sludge products comprises a significant risk. The bioavailability considerations in these paragraphs should justify marketing the low Pb concentration products available.

We believe EPA must consider the low bioavailability of Pb in ingested sludge products in making this Rule. The bioavailability of Pb in soil (and even lower bioavailability of Pb in sludge fed to livestock) indicates that a threshold Pb concentration, (≈300 mg/kg), must be exceeded before the Pb present adds significantly to risk. Chaney et al. (1989) found the bioavailability of Pb in urban garden soils to rats (in a chronic exposure test) was strongly dependent on the concentration of Pb in the soil. Thus, when soil containing 1000 mg Pb/kg is fed at 5% of the diet, the Pb is only 20 % as available as Pb fed in equivalent amounts as lead-acetate. At lower soil-Pb levels, the bioavailability was reduced further, and no increase in bone Pb occurred when background soil (11 mg Pb/kg) was fed at 5% of diet.

Sludges have been fed to many classes of livestock and experimental animals. In this work (summarized in Table 2), bone-Pb and liver- and or kidney-Pb concentrations were usually reported. Often, small increases occurred in liver- and kidney-Pb, whereas little or no increase occurred in bone-Pb. Cessation of sludge ingestion allowed soft tissue Pb concentration to revert to background levels, but bone-Pb was unchanged (e.g. Baxter et al., 1982). A very different response pattern is observed when soluble Pb salts are fed to livestock.

Table 2. Effect of ingesting sewage sludges with different properties on the concentration of Pb in bones of livestock.

Study	Sludge Source	Pb Concn. in sludge	Sludge in diet	Dietary Pb Control	Dietary Pb +sludge	Duration Fed	Bone Pb Control	Bone Pb +sludge
		mg/kg	%	----mg/kg DW---		days	----mg/kg DW	
1.	Ft. Collins	466	11.5	0.86	56.6	106	5.0	7.2*
2.	Ft. Collins	387	12.0	1.8	50.0	270	1.6	4.3*
3.	Denver	780	4.0	0.6	26.	94	1.	4. *
3.	Denver	780	12.0	0.6	77.	94	1.	11. *
4.	Washington,DC	215	3.3	6.0	11.2	180	3.7	4.7NS
4.	Washington,DC	215	10.0	6.0	19.9	180	3.7	3.4NS
5.	Las Cruces	150	7.0	-	+10.5	1440	-	- NS
6.	Chicago	-	-	-	-		-	- NS

* Bone Pb concentration significantly increased by sludge ingestion.

1. Johnson et al. (1981). Hereford steers.
2. Baxter et al. (1982). Cows and steers.
3. Kienholz et al. (1979). Feedlot steers.
4. Decker et al. (1980). Cows, calves, and steers. Composted sludge, high in Fe and $CaCO_3$.
5. Smith et al. (1985) Sheep. No significant change of Pb in liver.
6. Hansen et al. (1981). Foraging sows. Soil Pb in 504 mt/ha plot = 131 mg/kg, while control plot soil was 37.7 mg Pb/kg. Feces were 7.9 and 41. 7 mg Pb/kg FW in March. Bone not analyzed, but liver and kidney showed no significant change in tissue Pb.

The conclusion from the above discussion of the risk of Pb toxicity to humans from direct ingestion of sewage sludge or sludge compost has to be set in the context of information about bioavailability of Pb in ingested soil and sludge materials. A 2-6 year old child may ingest 0.5 g soil/day (95th percentile) or even 5-10 g/day (99th percentile) (Calabrese et al., 1989), compared to 250 g dry diet per day (obtained from Mr. R. Bruins, EPA, Cincinnati, who converted the Pennington diet values to dry matter basis). This would convert to 5/250 = 2% of diet to 10/250 = 4% of diet. Although water borne Pb is of much higher risk if ingested between meals, there is no evidence that soil-Pb or sludge-Pb is of unusual risk if ingested between meals.

Sludge products (including compost) which are to be marketed must be considered in light of the potential for direct ingestion of pure sludge from the soil surface or from the bag or piles awaiting utilization at private homes. For many chemical reasons, and because of the low Pb deposition (bioavailability) during the sludge-feeding experiments described above, it is clear the Pb in sludge products can be expected to have very low bioavailability. The data are incomplete, because sludges have been fed to few monogastric animals, and seldom has Pb-acetate been fed to livestock as a 100% bioavailable control. These feeding studies usually included up to 10% sludge product because the researchers tried to evaluate a worst case of short-term exposure, not the chronic long-term exposure usually considered to be about 2.5% of diet.

A reconsideration of the relationship of sludge dose (g sludge ingested per day) and response (blood or tissue Pb concentration) indicates that the strong adsorption of Pb by sludge appears to cause tissue Pb to reach a plateau with increasing sludge ingestion. The usual consideration of the "pica" child is that tissue Pb will be a linear response of the ingested sludge dose. This plateau response follows the concepts of metal adsorption to the sludge specific adsorption sites, much like the plateau response of plant uptake to increasing sludge application rate (Corey et al., 1987). If increasing amounts of sludge-Pb is ingested, increasing amounts of sludge metal adsorption sites are ingested. Only one published study has evaluated the dose response of Pb in ingested soil or dust (Stara et al., 1973). Their data fit the plateau model.

How much sludge product may the EPA valid "MEI" 1-5 year old child ingest? Are fibrous sludge products likely to be ingested at as high a rate as the fine fraction of soils adhering to children's hands and toys? Usually the fine fraction (< 0.1 mm diameter) is considered to constitute the bulk of the "soil/dust" material actually ingested by children. However, the true "pica child" ingests whole soil including large sand grains (> 1 mm diameter). This true "pica child" has to be the worst case MEI, but he is a very small fraction of children. Studies feeding sludge containing less than 300 mg Pb/kg to animals showed no increased bioavailability of Pb over control animals (Table 2). The percent of sludge in the diet of the true pica child is similar to that of the animal feeding studies. Therefore, if we assume that bioavailability of the pica child is similar to that of animals, a concentration of 300 mg Pb/kg sludge should be considered to be safe. Furthermore, the true pica child who ingests 5-10 g soil/day (2 to 4% of the dry diet) represents less than 1% of the children between 2 and 6. Thus, on a U.S. population basis this represents an extreme individual who has a very low probability of occurrence, but would represent the MEI.

A limit of 300 mg Pb/kg would allow marketing of sludge materials from POTWs controlling industrial Pb inputs; cessation of use of Pb as a gasoline additive has significantly lowered the Pb concentration in sludges. Composted sludges and heat-dried activated sludges are even lower in Pb than digested sludges. Perhaps a limit of 300 mg Pb/kg could be used without practically limiting sludge D&M, but still not risking Pb poisoning of the MEI pica child.

In the **Pathway 2F-Agricultural Land Application** scenario, soil ingestion occurs from the sludge-soil mixture. As with other models, we assume that sludge is uniformly mixed with 15 cm soil. Using the same reasoning as above, the soil could be up to 300 mg Pb/kg. Background soil would contain about 10 mg Pb/kg, so 290 mg increased Pb/kg could be allowed if the reasoning is accepted. This is 580 kg sludge-Pb/ha.

Pathway 1 (sludge→soil→plant→human): We discussed in the previous section the importance of protecting children from increased Pb exposure. A substantial portion of urban children exceed the 10-15 µg Pb/dL presently recommended as the maximum limit of Pb for children. Surprisingly, however, white male blood pressure was selected as the health effect to limit sludge Pb applications in the TSD.

However, the greatest flaw in the TSD estimation of Pb risk under Pathway 1 is the slopes of Pb uptake by crops used. Many studies have been conducted with crops grown on sludge-amended soils, and some have included Pb transfer during animal feeding studies. In nearly every case (even with sludge Pb > 1000 mg/kg), crop Pb was not influenced by sludge application (e.g., Chaney et al. 1978b). Often sludge application significantly reduced crop Pb concentration. As in other cases, EPA ignores this literature because they could not estimate positive slopes for plant uptake from available field sludge studies. Because sludge adds Pb-adsorption capacity to the sludge-amended soil, it is inappropriate to use any data from non-sludge Pb research studies.

The RE for Pb in crops grown on sludge-amended soils is low, apparently lower than that of crops grown on normally fertilized soils. This can be estimated from the results of numerous animal feeding studies, such as those conducted by Chaney et al. (1978b). Even though Swiss chard was slightly higher in Pb on some of the sludge-treated plots, there was no significant change in Pb in tissues of the guinea pigs fed the chard for 80 days.

It is important to note that nearly all the published results for Pb concentration in foods are too high. Unless "clean rooms" are used to prevent Pb contamination of samples, the Pb pollution of urban dust causes analytical results to be falsely high (Patterson, 1980; Wolnik et al. 1983a; 1983b; 1985). Thus, most of the research assessments of Pb uptake by crops are flawed, including data from study of all kinds of Pb sources. Because of these errors, it is especially important that EPA consider the data from animal feeding studies. In most such studies, feeding sludge-grown crops caused no change in tissue Pb for several experimental animals (Chaney et al., 1978b; Logan and Chaney, 1983).

All these considerations must be made in relation to the limit that will be imposed to protect the pica child in Pathway 2F. Direct ingestion of sludge (2F-D&M) allows much greater Pb ingestion risk than does consumption of crops grown on sludge-treated soils, especially when considered on a body weight basis. Thus, the soil will be limited to no higher that 100% sludge in Pathway 1, because that is the case considered in Pathway 2F-D&M. In practice, other elements will limit the cumulative application of sludge to far lower that 100% of the surface 0-15 cm soil. At 1000 mt/ha, the soil is 50% sludge DW. Using the 300 mg Pb/kg "clean sludge" to protect Pathway 2F-D&M limits soil Pb to 150 mg/kg at 1000 mt/ha [(3000 mg Pb/kg sludge DM)·(1000 mt sludge/ha) = 300 kg Pb/ha = 150 mg Pb/kg which is lower than required in Pathway 2F -Agr. Land. Field studies of Pb uptake by crops clearly demonstrate no increase in risk of Pb transfer to foods at this low application of sludge-Pb. Of course, this is true for the case 1F, worst case (≈ 50%) garden foods scenario also.

As noted above, all sludge-Pb human exposure cases become Pathway 2F for D&M products. Thus, setting the Pathway 2F Pb application limit on the basis of soil and sludge Pb bioavailability upon ingestion by the pica child is a promising basis for minimizing human health effects from sludge-Pb.

Comparison of estimated sludge-Pb application limits.

Pathway	TSD Limit	Corrected Limit
	-Max.	kg Pb/ha-
9 (Sludge→Soil→Soil Biota→Predator)	125	> 1000
7 (Sludge→Soil→Plant	-	>> 1000
1F (Sludge→Soil→Plant→Human)	195	> 1000
2F-Agr. Land (Sludge→Soil→Human)	378	580
2F-D&M (Sludge→Human)	378	300 mg/kg
1 (Sludge→Soil→Plant→Human)	1190	>> 1000

Cadmium

Pathway 1F (sludge→soil→plant→human): The summary Table 6-3 (TSD) indicates that Pathway 1F most limits the Cd input in the agricultural land application. The limit is 18.4 kg Cd/ha. This pathway is complicated because it involves not only the use of a MEI but also varieties of crop plants, and livestock animals in the exposure computation. Even with the aid of RAMMS, it was difficult for us to follow the computation or to examine the validity of data used. Instead, we scanned the references to learn which data EPA used to estimate the transfer coefficients. While there were entries of data from "salt" spiked experiment, their effects on the overall outcome of the risk assessment is difficult to estimate as they constituted only a fraction of the plant or animal products entered into the calculation. We recognize deficiencies of the available data and do not consider this type of infraction a major flaw unless a majority of the data used in a category are derived from inappropriate sources.

Except for generic deficiencies on assumptions (eg. fraction of the diets affected, relative effectiveness, duration of exposure, etc.) which have been discussed elsewhere in this report, we feel the final result of this pathway is realistic because it is close to the application limit estimated by Chaney et al. (1987) when they corrected the acidic garden scenario to account for the Pennington (1983) food ingestion data, and for the differences among crop species in relative uptake of Cd from acidic sludge-amended soils.

Pathway 7 (sludge→soil→plant): Interestingly, the TSD calculated a limit (178 kg Cd/ha) based on Pathway 7. Although we agree that we are not familiar with published field studies which measure specific Cd toxicity of sludge-applied

Cd to plants, there were many Cd-salt-spiked sludge studies published by Bingham and co-workers (e.g. Bingham et al., 1979; Mahler et al., 1982) over the years. Part of that work used acidic soils, and rice, spinach, bean, and other species more sensitive to soil Cd, than the most sensitive case described in the TSD (Cd-salt added to an acidic organic soil). The high soil organic matter content in the study cited in the TSD (John, 1973), makes Cd much less toxic than would be observed in light-textured soils of the U.S. southeast. Actually, the data in Table 4-49 of the TSD essentially all violate one or several criteria for data use in this kind of assessment: 1) no evidence was provided that Cd caused the observed toxicity; and 2) Cd salts can never simulate the true potential for phytotoxicity of sludge-applied Cd. Further, Heckman et al. (1987) noted that 21 kg salt-Cd/ha (field application) caused Cd-specific phytotoxicity to soybean in a strongly acidic soil. Sludge-applied Cd did not cause equal phytotoxicity under strongly acidic conditions.

We believe that phytotoxicity from sludge-applied Cd is less limiting to sludge-Cd application than the potential for food-chain toxicity of Cd using a conservative model. So the EPA conclusion about the risk from Pathway 7 compared to Pathway 1F is correct even if the estimate for Pathway 1F is 10-fold too high.

Pathway 9 (sludge→soil→soil biota→predator): The TSD calculated a limit based on Pathway 9, but the specific limit is not shown in section 4.9.2.2, or in Table 6-3. Further, the Cd application limit from Pathway 9 appears to be much lower than the limit EPA estimated for Pathway 1F (the present limiting pathway). If this estimated Pathway 9 limit were properly based, it would have unexpectedly limited sludge Cd in the Proposed Rule.

As we have noted above, a number of errors were allowed to enter the estimations in Pathway 9. The most important errors were the fraction of diet represented by the sludge-influenced soil biota, and the bioavailability of earthworm-Cd to animals which ingest live earthworms with significant soil contamination. Further, studies of Cd tolerance by birds often included animals with Zn or Cu or Fe-limited, purified diets. Such diets allow greater toxicity of Cd than do normal "earthworm diets. The estimate under the TSD method would be: $\mathrm{RLC} = [(6.0_{TA} - 4.8_{BB})/\ 2.3_{UB}] + 0.2_{BS} = [1.2/2.3] + 0.2 = 0.7$ mg Cd/kg. The sludge-applied increment would be 0.5 kg Cd/ha. This estimate used the lower Cd accumulating species of worm studied by Hartenstein et al. (1980), which we believe is not a proper predictor of the uptake slope for soil earthworms.

The slope estimate from Beyer et al. (1982) is only 13.7 mg Cd/kg earthworm DW per mg Cd/kg (from the TSD) or 20.1 (our calculation using (57-4.8)/(2.7-0.10) = 52.2/2.6 = 20.1). The slope for the highest Cd soil, 8.2 mg Cd/kg, was only 14.1 mg Cd/kg earthworm DW per mg Cd/kg soil. Using the 18.4 kg Cd/ha allowed under Pathway 1F, we obtain $18.4/2 = 9.2 + 0.2_{BS} = 9.4$ mg Cd/kg soil. Using the above slope (14.1), the expected earthworm Cd would be: $(14.1)\cdot(9.2) = 130$ mg Cd/kg DW. If birds consumed 1/3 of their diet as earthworms from one sludge-amended field, their diet would contain 43.2 mg Cd/kg DW. Again, we must consider that soil inside the ingested earthworms should further reduce the bioavailability of the ingested Cd. However, in contrast with Pb, the earthworms bioaccumulate Cd and the accumulated Cd is the basis for risk estimation, compared to Pb where the soil in the ingested earthworms is the basis for the risk estimation.

Is this level of Cd in earthworms a toxicity risk to the birds consuming adequate levels of Cu, Zn, and Fe? Adequate levels of these metals prevent the dietary deficiency-induced sensitivity of animals to Cd ingestion. Another toxicity consideration is research on shrews ingesting earthworms from a Cd + Cu polluted soil in the UK (Dodds-Smith et al.; 1986, and Hunter et al., 1981). Hunter et al., (1983) also attempted to evaluate the toxicological significance of metals to wildlife. They observed injury to kidneys in shrews with very high body burdens of Cd and Cu. These research sites were highly contaminated with Zn, Pb, and/or Cu, 34000 mg Pb or Zn/kg and/or 50000 mg Cu/kg, but only 10-50 mg Cd/kg), and do not allow unequivocal conclusions regarding Cd pollution. Information in Hunter et al. (1983), plus that in a paper describing the food-chain relationships of Cd and Cu at the same locations (Hunter and Johnson, 1982), indicates that very high soil contamination with Cd would be necessary for Cd to affect the health of these short-lived (< 2 yr) mammals. To use these data, one must be careful to determine the dry vs. wet weight basis of the information reported. Kidneys did not exceed 200 mg Cd/kg fresh weight.

The potential toxicity of Cd to birds was examined in the TSD (Table 4-42, page 4-225) which contains a listing of many sources of data. Again, few of these data are relevant to evaluating risk to birds ingesting earthworms from sludge-amended soils. Stoewsand, et al. (1986) fed earthworms from control fields to Japanese quail; no toxicity resulted, although kidney and liver did accumulate Cd. Thus, we conclude that Pathway 9 is not more limiting to sludge application than Pathway 1F.

Comparison of estimated sludge-Cd application limits.

Pathway	TSD Limit	Corrected Limit
	---Max. kg Cd/ha---	
Pathway 1F (Sludge→Soil→Plant→Human):	18.4	Near Correct
Pathway 7 (Sludge→Soil→Plant):	178.	> 20
Pathway 9 (Sludge→Soil→Soil Biota→Predator):	-	> 20

Arsenic

Pathway 2F (sludge→human) or (sludge→soil→human): Arsenic is included in the risk assessment because of its toxicity to humans. Inorganic As causes skin cancer in humans when excessive amounts of arsenate are ingested in drinking water over a prolonged period. In the TSD, Pathway 2F (sludge→soil→human) limits the input of As in agricultural land application. This is a relatively simple pathway. We feel the equation used for the calculation is acceptable if the proper data are used. We know of no basis to use daily As ingestion limits other than using the As MCL of the National Drinking Water Standard as the threshold in determining reference daily intake (RfD = 0.0014 mg/kg body weight/day). However, as discussed below, because this number is based on the possibility of developing skin cancer after 70 years of continual exposure, it may be necessary to treat As like the carcinogenic organic chemicals in the TSD calculations. Further, the Drinking Water Science Advisory Board has recently advised EPA that a threshold of 250 μg As/day should be used in developing Rules regarding As. This is 2.5 fold the present limit.

The final human receptor of Pathway 2F is a child who ingests soil. As the arsenic induced skin cancer results from long duration chronic exposure, is it realistic or reasonable to assume a child (with, at the most, five years of maximum As exposure through this pathway) will develop cancer from As in ingested soil or sludge? This RfD is based on a cancer potency of 70 years exposure duration. This number should be adjusted for the Pathway 2F short term exposure. Other carcinogenic chemicals were approached with a potency factor, and an exposure duration. The As MCL was calculated from the potency factor by another EPA office. Thus, the TSD failed to correct for the short exposure durations of children to ingested soil-As.

Another weakness in the model is the assumption that As remains in the soil indefinitely. Applied As has a half-life in soils of about 7 years because trimethylarsine is formed and volatilized from the soil (Woolson, 1975). Thus, As cumulative applications should reflect this loss pathway. The loss rate constant (k) for a 7 year half-life would be = $\ln(2) \div 7 = 0.1\ yr^{-1}$.

The Pathway 2 calculations also assumed 100% absorption of sludge/soil As from the gut. In sludge, As bioavailability is likely on the order of 5-10%, (while soil As probably has higher bioavailability than sludge, say 10-20%) compared to the 100% bioavailability of Na arsenate in drinking water (Chaney, personal communication).

The TSD assumes that all As in the background diet has equal likelihood to induce cancer as Na arsenate in water. Research has shown that most food As is in fish products, and that As in fish exists largely as an organic derivative, arsenobetaine. This chemical As species is nearly all excreted intact, and does not undergo metabolic reactions necessary for As to be involved in skin cancer. Much of the As in vegetable foods also exists as organic As compounds, with little potential for toxicity to humans (Pyles and Woolson, 1982).

One key assumption in Pathway 2F is the amount of soil ingested each day. In the discussion of Pb, we note that soil ingestion by the 95th percentile youngster is about 0.5 g/day (Calabrese et al., 1989), rather than the mean 0.1 g soil/day used in the TSD.

Calculation of the 14 kg sludge-As application allowed for Pathway 2F in table 6-3 was instructive. For example, 14 kg As/ha = 7 mg As/kg soil. Ingestion of 0.1 g soil/day would allow increased ingestion of 0.7 μg As/day. If exposure is limited in the original calculation by the RfD - TBI = 14 μg/d

- 13 µg/g = 1 µg/day, the allowed application would be 1/.1 = 10 mg/kg; 10 (max.) - 3 (background) = 7 mg/kg (addition) = 14 kg/ha. However, this does not adjust for RE and DA, nor volatilization.

If soil As bioavailability is assumed to be 20%:

RIA = $[(0.0014_{RfD}$ mg/kg/d·10 kg Body Weight)÷$0.2_{RE})$ - 0.013_{TBI} mg/day]·10^{-3} = 70-13 = 57 µg soil-As/day.

This equation is approximate because the RE is used to adjust only the increased exposure, not the total dietary exposure.

One then calculates the RLC using the RIA, soil ingestion rate (I_s = 0.5 g/day), and exposure duration adjustment (DA = 0.07). RLC = (57 µg soil-As/day)÷[(0.5 g soil/day)·0.07_{DA}) = 1628 mg As/kg soil to cause this exposure. This number would be still higher if As volatilization was considered (equation 6 on page 4-113). Even pure sludge has not been observed to have this high level of As (mean sludge As = 18.5, median = 13.1, range of 15 small cities = 0.1-89.8 in Mumma et al., 1988; median = 4.4 mg As/kg in 40-city study). Thus, there appears to be little risk from this route.

Other pathways were not examined in detail as these As limitations would not influence sludge utilization. However, other risk assessments fail to find large transfer of soil As to plants needed for risk in Pathways 1 and 1F.

Comparison of Estimated Sludge-As Application Limits:

Pathway	TSD Limit	Corrected Limit
	--Max. kg As/ha--	
1:Sludge→Soil→Plant→Human	6960	?
1F:Sludge→Soil→Plant→Human	382	?
2F:Sludge→Human	14	1628

Selenium

Pathway 5 (sludge→soil→plant→animal): Selenium occurs naturally in all soils. Selenium is required by animals. Disorders associated with selenium deficiencies are commonly observed, whereas toxicities are occasionally observed, to both humans and animals, because of localized soil Se enrichment from geochemical sources. Although Se is not known to be an essential plant nutrient, Se is readily absorbed by plants if it is present in the soils. Plant uptake of Se is dependent on many soil chemical factors, most importantly, soil pH, oxidation state of Se, and sulfate concentration. Selenium concentrations in municipal sludges are generally low (median levels of 1-2 mg/kg). A few field studies of Se in sludge-amended soils did not show significant plant response to sludge-borne Se. Logan et al. (1987) found Se in Swiss Chard grown in a sludge-amended calcareous soil (total Se input approximately 6 kg/ha) was not significantly different from that of the control. Similarly, Chaney et al.

(1978a, 1978b) did not observed significantly increased Se uptake by lettuce or Swiss chard grown on soil amended with several sludges, whereas fly ash usually increased crop Se (Gutenmann et al., 1976). One conclusion of that research was that fly ash could be applied as a Se fertilizer to help correct Se deficiency in crops used as food or feed. Other than this evidence that the plant uptake of sludge-applied Se has a lower slope than found in traditional studies with added selenate, we have no additional information that would improve the current assessment of the sludge-borne Se toxicity to foraging animals. The maximum tolerated dietary Se, 2.3 mg Se/kg, is higher than the NAS (1980) recommendation of 2.0 mg/kg for chronic Se ingestion. However, within the methodology, 2.3 mg Se/kg is the proper number.

Recent identification of Se problems in California (Kesterson Reservoir) has significantly improved the data base for Se uptake by grain and forage crops. Alfalfa is a relative accumulator of soil Se, and has been used in several tests; however, sulfate strongly inhibits Se uptake by alfalfa, and sulfate will be present at substantial levels in sludge-treated soils.

Basic to any discussion of Se is appreciation for the different forms of Se that can exist. Se may exist as selenite or selenate, and the availability to plants is greater for the selenate form (selenite is much more strongly adsorbed by soils). Sulfate inhibits plant uptake of selenate. Further, over a period of years, Se slowly leaches through the soil. Thus, some effort should be made to account for Se leaching and possible effects on reducing the soil Se inventory as well as Se contamination of groundwater.

Using the allowed forage Se, 2.3 mg/kg, and the slope for Se uptake of 0.07 [(mg Se/kg forage DW)·(kg Se/ha)$^{-1}$], and the background crop Se of 0.03 mg Se/kg forage DW, one calculates (2.3-0.03)/0.07 = 32.4 kg Se/ha. The median sludge (2 mg Se/kg) could be applied at a cumulative application rate of 16,200 mt/ha under this limit. Sludge Se is normally less than 10 mg/kg (e.g., the median sludge Se in the Mumma et al. (1988) paper cited above was only 2.1 mg/kg DW; for the 40-city study, median Se was 1.45 mg/kg, and the 90th percentile was 9.06 mg/kg). Thus, the cumulative Se limit of 32.4 kg Se/ha would allow 3240 mt of the median sludge DW/ha, and would not practically limit sludge utilization. However, the 40-city study did identify 2 POTWs with much higher Se than reported in previous surveys, 45 and 193 mg Se/kg. Such data support the need to identify the very few POTWs which suffer from industrial Se discharge sufficiently great to cause a problem in livestock, if sludge were used on forage crops.

Molybdenum

Pathway 5 (sludge→soil→plant→animal): Sludge Mo applications were estimated by EPA to be limited to 5.07 kg/ha, using Pathway 5. This pathway involves plant uptake of sludge-applied Mo by forage crops and toxicity of crop Mo to ruminant livestock. Excessive soil Mo, in neutral pH soils, can poison livestock by this pathway (Logan & Chaney, 1983). The toxicity mechanism is well characterized: Mo is transformed in the rumen to thiomolybdate, which binds Cu and prevents both Cu absorption from the gut and Cu utilization within the animal. The most sensitive livestock are Cu-deficient sheep and cattle (NAS, 1980). However, forage crops grown on sludge-amended soils are not Cu-deficient;

rather, these crops have normal to somewhat enriched Cu levels depending on soil and sludge properties. Therefore, the impact of Mo is reduced considerably.

Another consideration is that cured forage from high Mo areas, when consumed by ruminants, will be less toxic than the same forage grazed in a succulent state (Mills and Davis, 1987). The higher the energy level of the diet, the more sulfide is produced in the rumen, thus forming the thiomolybdate which causes the toxic effect of Mo. Accordingly, the form of Mo, as well as the forage type and crop species, must be taken into consideration when relating dietary levels of Mo to the degree of toxicity to ruminants.

The amounts of Mo absorbed by crops vary with soil properties. Generally, the availability of Mo to crops increases with increasing soil pH. Higher soil pH also increases the potential for Mo leaching. Results for farm fields contaminated by a Mo smelter indicated that the plow-layer accumulation of Mo in the field was inversely related to the pH maintained in the soil over a 40 year period (Hornick, et al., 1977). Two miles from the smelter, Mo decreased from 71.6 mg Mo/kg soil at pH 4 to 19.2 at pH 6.

Plant materials are tolerant to relatively high concentrations of Mo. Cabbage, an accumulator of Mo, grew normally at a plant concentration of 1060 mg/kg Mo. (Hornick, et al., 1977). Jarrell, et al., (1980) also observed that large quantities of Mo may be added to soils with little effect on growing plants.

The TSD considers Mo in section 4.5.2.3 and identifies the threshold Mo feed concentration toxic to herbivore animals (TA_H) = 5 mg/kg DW. The document claims this is the lowest feed concentration showing a toxic effect on cattle when normal dietary Cu levels in the feed are 8-10 mg/kg DW. It is claimed that "because no other concentration of Mo was tested in this study, it is not possible to calculate the mean between the level that barely causes an effect and the highest level that does not cause an effect". However, the next 11 pages contain tables summarizing Mo toxicity to all classes of livestock.

The Buck (1978) reference relied on is a review or summary of general understandings or a recommendation to management, not the specific results of an experimental test of forage Mo toxic to livestock. If only a review article was to be considered, surely the National Academy of Sciences (1980) expert committee report [Mineral Tolerance of Domestic Livestock], which was subjected to extensive internal and external review, is more credible. They evaluated low level chronic Mo toxicity to the most sensitive livestock (beef cattle) as "5 to 10 ppm (mg/kg) Mo, which have been weakly associated with impaired bone development in young horses and cattle". It must be emphasized that substantially higher levels of Mo would be tolerated in the presence of adequate copper and inorganic sulfate. Sludge grown forages are normal in Cu and sulfate, so the higher recommendation of about 10 mg/kg forage Mo is more appropriate. A large body of data on the toxicity of Mo toxic forages grown on soil naturally high in Mo (not Mo salt additions to diets) supports use of 10 mg/kg Mo for forage with normal Cu concentration (NAS, 1980 Table 1 [page 5]).

The next component of the exposure estimate involves the linear Mo uptake slope of forage crops. The TSD used 0.769 mg Mo/kg forage DW·[kg Mo/ha]$^{-1}$, calculated from results of a field study of sludge applications on composition of fodder rape (Andersson and Nilsson, 1972). The background plant tissue concentration of 1.1±0.11 mg Mo/kg DW was selected from the same study. Although this study generally fits the criteria for reliable studies, the range of applied Mo was limited. Other data are available to test the risk model more reliably. Only a small change in forage Mo was observed in Andersson and Nilsson (1972), because a sludge with normal, low (7.4 mg Mo/kg) concentrations was used. The linear extrapolation was from the observed maximum of 1.7 mg Mo/kg dry rape forage to 5 mg/kg, the estimated maximum forage Mo before toxicity occurs to the cattle. Applied Mo was approximately 0.83 kg/ha (0.0074 kg Mo/mt sludge DM, times 14 mt sludge/ha·2 years, times 8 applications) (background soil contained 0.53±0.02 mg Mo/kg, while treated soil contained 0.69 mg Mo/kg). Table 4.46 incorrectly indicates that the Mo application rate was 0.78 kg/ha. The table then reports an uptake slope of 0.769 when the correct value should have been 0.8 with the correct number of significant figures (1.7 mg Mo/kg in sludge fertilized forage - 1.1 mg Mo/kg control forage = 0.6 mg Mo/kg increase due to sludge application over a 15 year period (1 significant figure of crop Mo change). Table 4.46 (Uptake of Mo by plants) contains only this one forage crop example, although other direct human food crops are reported. We believe the method used to estimate safe applications of Mo in sludge can be improved.

Experiments have been conducted to test the risk potential of sludge Mo. Field data are available for Mo-rich sludges which readily caused high increase in forage Mo. Actually, only highly Mo enriched sludges have been shown to cause high Mo forages. A median sludge (6.5 mg Mo/kg sludge), (11.0 mean; Mumma et al., 1988) did not raise forage Mo to risk levels in any tests. However, as noted below, sludges with high Mo levels can readily cause increased forage Mo. Further, the data indicate that sludge Fe or other element oxides (known to adsorb Mo in soils) increase the Mo adsorption of sludge-amended soils.

One field test of the plant uptake slope for sludge-applied Mo was reported by Webber et al., (1983). They evaluated corn leaf Mo concentration at 10 field sludge utilization sites. Sludges contained <20 to 206 mg Mo/kg, with estimated loadings of <0.2 to 19.4 kg Mo/ha over the known application period. The soils were analyzed at the one site where excessive forage Mo was achieved, and contained 19.2 mg Mo/kg D.W. soil. Among the 10 locations, forage Mo was significantly decreased due to sludge application at 2 locations, not significantly changed at 4 locations, and not above background at 3 others sampled. Only the high Mo sludge (206 mg/kg) caused high soil and forage Mo. Thus, soil Mo of 19.2 ppm (presume 19.2 mg Mo/kg soil·2000 mt soil/ha·15 cm = 38.4 kg Mo/ha) caused corn forage Mo to increase from 0.72 to 32.2 mg/kg. This gives a slope of 31.5/38.4 or 0.560 mg Mo/g forage DW·[kg Mo/ha]$^{-1}$. Using the control forage Mo concentration (0.72 mg/kg) and Mo uptake slope (0.538), one calculates 7.64 kg Mo/ha to reach the Mo toxicity threshold of 5 mg/kg forage Mo (for Cu-deficient forages) or 16.6 kg Mo/ha to reach 10 mg/kg Mo (for normal forage Cu concentrations).

In the 40 city survey, only 4 sludges were analyzed for Mo (0, 27.6, 35.6, and 7.5 mg Mo/kg DW). Other analyses suggest a median Mo value of 6.5 mg/kg (Mumma et al. 1988). Thus only Mo-rich sludges could cause the risk calculated. A more appropriate control would require pretreatment by industrial polluters causing sludge Mo enrichment above the approximately 20 mg Mo/kg found in unpolluted sludges. Normal sludge use would require about 100 years to apply 10 kg Mo/ha:

> [(10 mt sludge DW)·$(\text{ha}\cdot\text{yr})^{-1}$·(0.010 kg Mo·[mt sludge DW]$^{-1}$) = 0.1 kg Mo/ha·yr].

Further, substantial leaching of sludge-applied Mo would likely occur during the 100 year application period based on many studies, including Hornick et al. (1977).

Another approach to setting sludge-Mo application limits would be to use the recommendations of the Water Quality Criteria for irrigation water. The EPA Water Quality Criteria (1973) recommend that Mo in irrigation water not exceed 0.01 mg/L (for indefinite application on light-textured soils) or 0.05 mg/L (maximum 20 year application on heavy-textured soils). Assuming that the EPA Water Quality Criteria Document represents a no-adverse-effect level of applied Mo, at 1.2 m annual water application, at least 12 kg Mo/ha could be applied over 20 years with no detrimental effects. Pratt et al. (1988) recommended that Mo input from application of irrigation water not exceed 0.5 kg/ha/yr. If adequate leaching is provided, Mo loading can be maintained at this level indefinitely. Using either the EPA Water Criteria values or Pratt's newer numbers, the maximum allowable Mo loading exceeds the value calculated from the current risk assessment.

Mercury

Pathway 3 (sludge→soil→plant→animal→human): In the Proposed Rule, sludge-Hg was most limited by Pathway 3 at 14.9 kg Hg/ha. This value is likely non-limiting to sludge utilization because nearly all sludges have low Hg concentrations. Nevertheless, this estimate is apparently in error because researchers have detected no significant increase in plant uptake (leafy vegetables or forage crops) of Hg when sludges are applied to cropland. [Note: Page 4-176 is supposed to cover the Pathway 3 data for Hg, but discusses information on sludge ingestion and soil which belong in Pathway 4.]

The plant Hg-uptake slope is discussed on page 4-179, but the discussion omits several important sludge-Hg studies. Research from Denver reported no increase in forage crop Hg on sludge-fertilized pastures (Baxter et al., 1983). The large body of work by Lisk and co-workers who used neutron activation to obtain precise analyses of trace levels of Hg in numerous crops failed to identify significant increases in crop Hg concentrations due to application of even high levels of sludges (e.g., Chaney, et al., 1978 a,b). In fact, application of sludge reduced Hg concentration in Swiss chard grown on soils amended with 56-224 mt/ha of three sludges. Hg salt addition to soils caused some increase in plant Hg (Hogg et al., 1978, cited in the TSD), but such data are not relevant to sludge application. Hg is strongly bound by the organic fraction of the sludge at the time of application. Field research has shown that sludge reduced crop Hg even while the soil Hg was increased. This is further evidence that sludge metal adsorption sites control metal availability in sludge-amended soils. Thus, the risk estimated for Pathway 3 is erroneous.

Researchers recognize only three potential pathways for movement of sludge-Hg to humans or livestock, two by direct ingestion of sludge by livestock or children, and a third from culture of mushrooms on composts including sewage sludge Hg. Erosion of sludge to become sediments in aquatic ecosystems may allow conversion of Hg to methyl-Hg and promote bioaccumulation by fish.

Pathway 4 (sludge→soil→animal→human): Several studies of sludge ingestion by livestock reported Hg in tissues. In particular, the study by Kienholz et al. (1979) found a very small increase in liver and kidney Hg in cattle consuming 12% sludge, but no increase in blood-Hg or Hg in muscle or fat. A slope for "animal uptake of Hg from ingested sludge" can be estimated from these data. Pathway 4 for Hg, begins on page 4-217 (TSD). Uptake by livestock is addressed in paragraph vi on page 4-217. This cites "The uptake of mercury in animal tissues for each food group (UA) is described in 4.3.2.8, vi." That specific section, however, is for PCBs. Section 4.3.2.7 (page 4-170) is for Hg, but the source of the Hg is crops or other materials, not sludge. The cited paper of Vreman et al. (1986) has no relationship to sludge ingestion. The Johnson et al. (1981) study found no significant increase in muscle Hg from ingested sludge, nor did Baxter et al. (1980), or Kienholz et al. (1979). Small increases were observed in liver in several of these studies, but these were reported on a dry weight of liver basis by the Colorado researchers. Sludge feeding studies are available for swine (from Florida and Illinois) and sheep (from New Mexico), again showing no increase in tissue Hg except liver, and then very low slopes for the response. The present assessments are lacking because non-sludge sources were relied upon.

Pathway 1 (sludge→soil→plant→human): The selection of data for uptake of Hg by plants from sludge-treated soils (page 4-179) is especially poor. The Bull et al. (1977) data represents an aerosol source of Hg which polluted the shoots of plants directly, as was the Lindberg et al. (1979) data. The work of Hogg et al. (1978) represents surface-applied irrigation water containing isotopic Hg. The John, MacLean, and Weaver studies were each for freshly added Hg salts. The last line of 4.3.2.7.vi (TSD) claims that the Hogg et al. paper was a sludge/pot study, when in fact, no sludge was used in this research. Soils were mixed to contain 10 mg Hg/kg as three Hg compounds. The soils then were irrigated with sewage effluent, and bromegrass harvested three times. Crop Hg fell from 2.5 ppm maximum in the first harvest to 0.2 ppm in the third harvest, much as would be expected for equilibration of added metal salts with soils. Nothing in these data is relevant to preparing a limitation on sludge-Hg application to soils! As noted above, valid sludge field research are available showing that most sludges actually decrease crop Hg. These data are much preferable to the data used in the TSD to estimate risk.

Pathway 1M (sludge→soil→mushrooms→human): One pathway has been shown to require regulation of sludge-Hg when proper sludge-derived Hg data were used the assessment. The bioaccumulation of Hg by mushrooms appears to be so great that utilization of sludge compost or refuse-sludge co-compost in mushroom production may have to be prohibited. Domsch et al. (1976) showed that even low levels of sludge-borne Hg cause mushrooms to exceed 0.5 mg Hg/kg fresh weight, the limit now used by FDA for fish species which bioaccumulate methyl-Hg. Few data are available to develop a slope of Hg accumulation by mushrooms from compost. No data are available on bioavailability of mushroom-Hg (although mushroom-Cd has been shown to have very low bioavailability due to Cd sorption on chitin in the cell wall of these fungi). Perhaps the proper response of EPA would be to encourage any POTW wanting to market sludge compost for use in mushroom production to conduct experiments to test their site-specific response compared to the FDA standard. When enough data are available, a general standard might be prepared. It is conceivable that many sludge composts will be low enough in Hg, or contain some additive that lowers the potential for mushrooms to accumulate Hg. However, we are not familiar with data which supports use of sludge products in mushroom production at this time.

Pathway 9 (sludge→soil→soil biota→predator): Earthworm accumulation of Hg was tested by Helmke et al. (1979). After correction for soil contamination of the earthworm bodies, there was no significant accumulation of Hg from sludge-amended soils. Thus, Pathway 9 would not comprise a risk to wildlife, other than due to direct soil ingestion as Pathway 6.

The TSD estimates for maximum kg Hg/ha via Pathway 4 is 1000 kg Hg/ha, and for Pathway 2F is 110 kg Hg/ha. These greatly exceed loading rates expected with typical sludges. Thus, we made no further evaluation of the TSD on Hg.

Comparison of Estimated Sludge-Hg Application Limits:

Pathway	TSD Limit	Corrected Limit
	--Max.	kg Hg/ha--
3:Sludge→Soil→Plant→Animal→Human	14.9	?
2F:Sludge→Human	38.9	?
1F:Sludge→Soil→Plant→Human	110.	?
4:Sludge→Soil→Animal→Human	1000.	?
1:Sludge→Soil→Plant→Human	2000.	?
1M:Sludge→"Soil"→Mushroom→Human	?	?

Organics

Polychlorinated Biphenyls (PCBs)

The PRC has strong reservations regarding the derivation of limits for PCBs in Pathway 3 and Pathway 4. Because of the time constraints, it was not possible to examine the validity of the assumptions nor appropriateness of data used in the analyses of Pathway 3 (sludge→soil→animal→human) and Pathway 4 (sludge→soil→animal). The PRC is particularly concerned about the level of uncertainties/errors introduced into the PCB pathway analyses from the use of ^{14}C derived data, inappropriate use of data from pure compound studies conducted on unique soils (sands with extremely low organic carbon), and use of data from studies which do not clearly identify the specific PCB Aroclor evaluated. While we believe these errors to be large, their cumulative is unquantifiable at this time. In the limited time available, it was possible for the PRC only to spot the very obvious errors in the EPAs analyses of these two limiting pathways, and to provide the corrections below to the EPA number which appear in their analyses. Since time did not allow any examination of the numerical values used by the EPA in their analyses of these pathways, and the outcomes are inconsistent with the experience from the field experiments with sludge-applied PCBs, the PRC strongly urges the EPA to perform a detailed re-evaluation of their data selection and assumptions, and completely redo the analyses of these pathways.

The pathways most limiting sludge applications based on PCBs were Pathway 3, 0.00564 kg PCB/ha/yr (sludge→soil→plant→animal→human) and Pathway 4, at 0.0192 kg/ha/yr (sludge→soil→animal→human). These estimates are highly dependent on the diet model used, fraction of sludge/soil in diet (Pathway 4) or slope of plant/soil response curve (Pathway 3), and slope of the animal fat PCB concentration/diet PCB concentration.

The last transfer coefficient, diet to animal fat, was assigned a value of 4, based on Fries et al. (1973). A subsequent detailed review of this subject by Fries (1982) supports use of this value. No better data have been identified. However, it should be recognized that these data came from studies of ingestion of pure PCB compounds mixed with diet. One would expect equilibrated sludge-PCB or soil-PCB residues to have somewhat lower bioavailability.

Transfer coefficients in Pathway 3 are available for few toxic organic compounds, but are often < 0.1, and frequently < 0.01 mg/kg plant DW·[mg/kg soil] (Overcash et al., 1986). O'Connor (1988) reported similar results for food-chain crops grown in sludge-amended soils contaminated with diethylhexylphthalate (DEHP), pentachlorophenol (PCP), and PCBs. Given the normally low concentration of priority organics in municipal sludges, minimal (below detection limits) uptake of priority organics is expected (O'Connor, 1988).

Pathway 3 (sludge→soil→plant→animal→human): We believe the value of the soil→plant transfer coefficient used [(0.25 mg PCB/kg forage)·(mg PCB/kg soil)$^{-1}$] is grossly inappropriate. This value is 10 fold greater then other transfer coefficient values in Table 4-20 (pg. 4-81) which should have suggested potentially unique data.

Most plant "uptake" studies with toxic organics utilized fresh additions of pure chemical, often to coarse-textured soils. "Uptake" is often measured by ^{14}C-labeled chemicals. Several recent studies suggest such experimental approaches can be seriously misleading. Fresh additions of ethylene dibromide (EDB) exhibit maximum bioavailability, but become decreasingly available with time (soil→plant ratio declines) due to bound residue formation (Frink and Bugbee, 1989). A number of low molecular weight halogenated compounds behave similarly (Pignatello, 1989; Sawhney, 1989). Others have found that hydrophobic organics become increasingly resistant to desorption, and thus presumably less available for plant uptake (DiToro and Horzempa, 1982; Karickhoff, 1980, 1984; Wu and Gschwend, 1986). Similarly, toxic organic behavior (especially hydrophobic organics) in coarse-textured, low organic matter soils has been shown to be different than in fine-textured, or higher organic matter content soils (Strek et al., 1981; Fairbanks and O'Connor, 1984; Fairbanks et al., 1983). Depending on the chemical used, reliance on ^{14}C assay to characterize compound uptake can also be misleading (Aranda et al. 1989; Bellin and O'Connor, 1989).

These factors and others (eg. use of fresh weights vs dry weights to express results; excessive chemical concentrations, etc.) complicate selection of appropriate transfer coefficients from the literature.

Fortunately, data from appropriate studies of sludge-PCBs are available upon which to base plant uptake slope calculations. One such study cited in the TSD (Webber et al. (1983), however, is misquoted and misused. Webber et al. (1983) found significantly increased soil PCB residues at several sludge-treated locations in Ontario, Canada. However, corn foliage or oat shoots growing on the soil were not significantly increased in PCBs due to sludge use. The TSD (Table 4-20) reports slopes for corn and oat when no significant difference was found, a serious misuse of data. Table 8 in Webber reports only the control oat sample, with no value reported for PCBs in oat samples from the sludge-treated soil! Thus, the data point which was most controlling on PCB uptake from sludge-soil mixtures according to the TSD was used incorrectly since it does not even represent a sludge-treated soil and plant sample! The Webber corn data which were next most limiting were from measurements where no significant difference was observed between sludge-treated and control crop. Webber et al. (1983) even concludes: "There was no evidence for increased PCB uptake from sludge-treated soils."

Recently, additional studies of sludge PCBs were undertaken using Madison, WI, aged-sludge containing 52 ppm total PCBs. Greenhouse pot studies of plant uptake of PCBs by tall fescue showed no detectable PCB residue regardless of sludge PCB application rate (O'Connor, 1989). From this work, the highest slope could have been ≤0.02 based on non-detection. If the control is also treated as non-detected, the uptake slope is zero. Taylor (1988) studied the same sludge in the field. Corn grain did not have a detectable PCB residue at any rate. Again, the uptake slope would be zero. The slope selected from the research of Weber and Strek (1980) on tall fescue uptake of PCB from soil treated with pure PCB compounds (0.25) is at least 12.5 fold too high, but probably 125-fold too high or more. Because data obtained from appropriate research with PCBs in sewage sludge under field conditions are available, the data from inappropriate pot studies should not be used.

Data listed for plant uptake of PCBs (Table 4-20) are lacking in other ways. For example, a reference by Hafner (1982) is supposed to represent lettuce uptake of PCB. The title of this reference, however, clearly identifies the compound as PCNB (pentachloronitrobenzene), not PCBs. New data for sludge-PCB amended soils that should be added are those of O'Connor et al. (1989). Crops were grown in pots of soils amended with aged Madison, WI sludge. Crops studied included carrots, lettuce, and tall fescue (noted above). No detectable PCB residues were found in plant tissues other than carrot peel. Use in the summary table on page 4-79 (TSD) of incorrect crop uptake estimate data from Table 4-20 (e.g. lettuce data for PCNB; peanut shoot data in place of peanut grain, etc.) falsely estimates higher PCB food chain transfer in Pathways 1 and 1F than would be obtained only through consumption of unpeeled carrot (slopes for other root vegetables are significantly lower than for carrot).

Presuming that the present Pathway 3 calculations were conducted correctly, a more appropriate PCB annual application rate would be $0.0056 \cdot \geq 125 = \geq 0.7$ kg/ha/yr. With a median sludge PCB of 0.26 mg/kg (Mumma et al., 1988),

(≥ 0.7 kg PCBs/ha)÷(0.00026 kg PCBs/mt sludge) = 2692 mt/ha of a median sludge could be safely applied under Pathway 3. The result of using appropriate plant uptake slope data is to shift the controlling pathway to Pathway 4. The direct ingestion pathway is generally agreed to allow the greatest transfer of sludge adsorbed organics into animals (Fries, 1982).

Pathway 4 (sludge→soil→animal→human): Transfer of PCBs from sludge to animal tissues in Pathway 4 is largely controlled by the soil/sludge portion of diet. The fraction used was found in section 4.6.2 (pg. 4-275) of the TSD as the fraction of diet that is adhering soil (FL) = 0.10 g soil/g diet; or the fraction of the animal diet that is sludge (FS) = 0.08. Sludge adherence to forage crops in short term research studies, measuring sludge in/on forage at 30 d after application, is about 5% (Chaney et al., 1987). However, season long average sludge intakes by grazing cattle on pastures which received surface-applied sludge as fertilizer, were about 2.5% sludge when sludge was applied at the rate necessary to supply crop nitrogen requirements, as required elsewhere in the Proposed Rules. Some of the higher sludge contamination results were for higher sludge application rates, and thus comprise a false-high estimate of sludge ingestion by grazing livestock. The sludge intake value used in the TSD (8-10%) is thus too high compared to field data based on fecal analysis. This would add a 8/2.5% fold error. It seems clear that ≤ 2.5% sludge in diet is the maximum exposure to livestock continuously grazing pastures amended with sludge 30 days before the animals enter the fields. If sludge were injected into soils, or intimately mixed in the plow layer, the potential for sludge ingestion is much lower. As noted elsewhere, the optimum regulatory approach to prevent risk from Pathway 4 is to require injection or tilling sludge into soils when sludge exceeds the PCBs concentration identified in this section as limiting sludges with typical N fertilizer value.

Ingesting 10% soil at 224 mt sludge/ha (10% sludge in soil) allows only 1% sludge in diet compared to ingesting at most 2.5% of surface applied sludge. Thus, the highest exposure scenario is through surface applied or adhering sludge.

Therefore, an appropriate estimate for annual application of sludge PCB to avoid risk through Pathway 4 is:

$$(0.0192 \text{ kg PCB/ha}\cdot\text{yr})\cdot[8\div2.5] = 0.06 \text{ kg/ha}\cdot\text{yr}.$$

This would allow surface applications of 236 mt/ha·yr of the median sludge containing 0.26 mg PCB/kg (indicated by Mumma et al., (1988).

Pathway 2F (sludge→soil→human): As an example, for organics in Pathway 2, PCB will again be examined. For organics, the pathway assumes that equilibrium will be reached after 34 applications. The decay constant and annual compound application control exposure. The TSD sets the $T_{1/2}$ at 6 years based on pure compound (Aroclor 1254) added to soils. More chlorinated congeners have longer half-lives, and environmental PCB residues are depleted in lesser chlorinated congeners (Fries, 1982). Fries (1982) selected 10 years as the $T_{1/2}$ for PCB in soil. Residues that equilibrate with soil are expected to have still longer half lives. (Frink and Bugbee, 1989).

The daily soil ingestion of 0.1 g/day is inappropriate. The 95th percentile at 0.5/day is more protective, although this is likely an overestimate of 5 year average daily ingestion. As with Pb in Pathway 2, other soil ingestion studies should be considered (Calabrese et al., 1989; Clausing et al., 1987; Richland, WA study of EPA, unpublished).

For perspective, 34 applications of sludge at 10 mt/ha/yr applications (340 mt/ha), are about 15 cm of composted sludge. Thus, this scenario inadvertently requires a massive and unlikely cumulative sludge application.

The present limit for PCBs in Pathway 2F is 0.264 kg/ha•yr. This would be reduced by 0.1/0.5 to protect the pica child, giving 0.05. If a median quality sludge (0.26 mg/kg, Mumma et al., 1988) applied this PCB, the resulting application rate would be 203 mt/ha.

The PRC wishes to stress that the corrections offered are intended only to remove obvious errors from the EPA's calculations, and that the final outcome of these corrections do not produce acceptable limits on PCB content since they are in conflict with our experience with data from field studies using sludge applied PCB.

Additional Elements of Concern

Iron

The Proposed Rule includes no controls on sludge Fe. However, other risk assessments for sludge utilization (e.g. Dean, et al., 1985) have noted sludge-Fe risks. Fe has been shown to harm cattle grazing pastures top-dressed with Fe-rich, anaerobically-digested sludge (Decker et al., 1980). Cu in sludge has low bioavailability, and appreciable amounts of the Fe in liquid digested sludge exists as the more toxic ferrous form. Thus, high Fe levels in digested sludge (11%) harmed the cattle by inducing Cu-deficiency. Certainly sludge Fe should not be ignored by the Proposed Rule when actual Fe has been observed detrimental to animal health in an experiment. When sludges are more stabilized aerobically, the Fe is essentially all present as Fe^{3+} and, Fe toxicity was not observed. Nor was Fe toxicity observed when sludge Fe was only 4%, and a 21-day waiting period after sludge application was imposed before grazing was permitted (Decker et al., 1980). The best regulatory approach would likely be to require anaerobically digested sludges which have high Fe concentration ($\geq$ 4%) be injected or mixed with soil. Research has led to a recommendation to increase the Fe concentration of sludges to limit plant uptake of Cd, Zn, etc. (Corey et al., 1987). Thus, the potential for Fe toxicity problems from surface applied sludges could increase in the future.

Fluoride

Risks from sludge-F were also neglected in the Proposed Rule. A few sludges contain very high levels of F due to industrial discharge, (particularly by the ceramics and electronics industries). Excessive sludge-F may injure livestock ingesting sludge from the surface of pastures. Research has not found appreciable risk from plant uptake of F or any other pathway considered in the Proposed Rule except direct sludge ingestion. In a study by Davis (1980), a sludge containing 33500 mg F/kg was applied to a silt loam soil in pots such that soil F was raised from 150 to 304 mg/kg. F concentration in the first cutting of ryegrass was 51.7 mg/kg DW, exceeding the 30 mg/kg maximum recommended dietary F level for cattle (NAS, 1980). However, the second cutting was just above 30 mg F/kg, and the third cutting near the background level in ryegrass. Thus, sludges containing extremely high levels of F may cause F uptake similar to additions of soluble F salts until the F has time to react with the soil. In contrast, normal sludges contain only about 300 mg F/kg, and no study has found increased plant uptake of F from these sludges.

Kienholz et al. (1979) found bone F was increased when Denver sludge (200 mg F/kg DW) was fed at high levels (12% of DW) in the diet of cattle. Bone F doubled after a 94 day feeding period. We have not attempted to develop a specific recommendation, but note that the median sludge F is about 260 mg/kg (from Davis, 1980; and Rea, 1979). This level would not appear to constitute appreciable risk to animals consuming sludge. Further, sludges rich in Ca would have lower bioavailability of sludge F because CaF_2 is relatively insoluble. Again, the best regulatory approach may be prohibition of surface applications of sludges with F levels above some injurious level.

DATA OMISSIONS

Table 3 (Table 6-3 of EPA, from page 6-6 the TSD) is a summary of the calculated limitations on sludge application for each regulated sludge constituent. One expects this to be a listing of all of the results from each of the pathway evaluations in Section 5 of the TSD. However, upon checking Section 5 pollutant transfer and risk analyses, we noted that four pollutant-by-pathway limitations were not listed in Table 6-3 (see highlighted numbers). These were Cd-Pathway 2F; chlordane-Pathway 3; Pb-Pathway 7 and Cd-Pathway 9. Especially prominent by its absence is the Cd pathway value. It appears to be more limiting than the other listed pathways for this element! All pathway values should be included in Table 3 and discussed.

Table 4 summarizes the PRC's analysis of the various pathways considered by EPA and illustrates that our review is not complete. It is apparent that EPA needs to continue the analysis that we have started and purge existing errors in the proposed rule.

SLUDGE MANAGEMENT USING THE "CLEAN SLUDGE" APPROACH

Sludge researchers have learned that realistic assessments of heavy metal risk to humans, livestock, wildlife, and plants is highly dependent on the concentration of elements in the sludge. The danger of Cu, Pb, Zn, and Cd in directly ingested sludges is negligible in median quality sludges. The danger of sludge Zn, Cu, Ni, etc., phytotoxicity was also negligible in median quality sludges.

Regulation and management of sludge utilization would be much easier, and would likely comprise less true risk to the health of animal and human populations, if the "Clean Sludge" approach were adopted. In this approach, cumulative element or compound applications are imposed only if the element or compound concentration in the sludge or compost exceeds some set value. Because sludge Fe plays a significant role in adsorbing sludge-applied Cd, Zn, Cu, Ni, etc., it may be necessary to consider element ratios, e.g. Cd:Fe. However, the potential savings to the country should compel EPA to evaluate whether the "Clean Sludge" approach is appropriate.

From the values presented in Table 4 a risk free sludge (i.e., "clean sludge") concept could be developed by assuming that for the worst case (maximum cumulative application) the soil would be 50% sludge. This would allow conversion of application rates to sludge concentration. Table 5 represents values for a clean sludge based upon this concept. In the case of some elements it may be more appropriate to use different assumptions about the percent of soil which is sludge. Also, in situations were such an analysis shows concentrations in sludge substantially greater than those attainable by pretreatment programs in effect, prudence would dictate the establishment oflower levels which still would encourage beneficial use but would not discourage pretreatment.

Table 3. Summary of cumulative pollutant application limits for each pathway as summarized by EPA with missing values highlighted.

POLLUTANT	Path 1	Path 1F	Path 2F	Path 3	Path 4	Path 5	Path 6	Path 7	Path 8	Path 9
	cumulative kg/ha									
Aldrin	0.77	2.17	264.	0.15	0.044	.	.	.	.	0.0164
As	6960.	382.	14.	.	.	.	.	.	.	.
BaP	0.83	6.5E6	2.0E9	.	.	.	.	.	.	.
Cd	309.	18.4	?????	580.	2.6E4	49.1	.	178.	.	?????
Chlordane	.	.	2.25	?????	15.9	.	.	.	.	.
Cr	.	.	.	.	.	.	.	530.	.	.
Cu	.	.	.	.	.	153.	458.	46.0	224.	.
DDT	0.27	0.046	9.35	0.0055	0.046	.	.	.	.	.
DNI	.	.	.	.	.	.	.	.	.	.
HEPC	0.98	2.5	.	0.15	0.073	.	.	.	.	.
HXBE	0.37	0.10	59.4	0.038	0.173	.	.	.	.	.
HXBU	.	.	41.0	.	0.339	.	.	.	.	.
Pb	1190.	195.	378.	.	.	.	.	?????	.	125.
Lindane	.	.	.	.	4.61	.	.	.	.	.
Hg	2000.	110.	39.8	14.9	1000.	.	.	.	.	.
Mo	.	.	.	.	.	5.07	.	.	.	.
Ni	5340.	206.	.	.	.	.	.	78.0	.	.
PCB	4.1	0.264	7.3	0.0056	0.019	.	.	.	.	.
Se	1310.	162.	.	46.6	.	32.4	.	.	.	.
Toxaphene	1.4	0.16	21.7	0.049	0.75	.	.	.	.	.
TCE	.	.	.	.	.	.	.	.	.	.
Zn	82000.	5870.	.	30000.	.	4720.	.	172.	.	452.
	1	1F	2F	3	4	5	6	7	8	9
	Sludge→ Soil→ Plant→ Human	Sludge→ Soil→ Plant→ Human	Sludge→ Soil→ Human	Sludge→ Soil→ Plant→ Animal→ Human	Sludge→ Soil→ Animal→ Human	Sludge→ Soil→ Plant→ Animal	Sludge→ Soil→ Animal	Sludge→ Soil→ Plant	Sludge→ Soil→ Soil Biota	Sludge→ Soil→ Soil Biota→ Predator
	Food Chain	Future Home Garden	Pica Child	Animal Food Chain	Sludge Ingestion Food-Chain	Animal Feeds	Grazing Livestock	Phyto-toxicity	Earthworms	Wildlife Food-Chains

Table 4. PRC Summary of pollutant application limits pathways analyzed.

POLLUTANT	Path 1	Path 1F	Path 2F	Path 5	Path 6	Path 7	Path 8	Path 9	Path 12
	cumulative kg/ha								
Cu				>2390	3930	1160	1200		
Zn						2750		>2600	
Ni		>>500		500*					
Cr						no basis			no basis
Pb	>>1000	>1000	580**			>>1000		>1000	
Cd		18				>20		>20	
As			1628						
Mo				17					

*See text for explanation of this value.

**For Pb and analysis of Pathway 2F for D&M the PRC concludes that sludge concentration shuld be 300 ppm or less.

Table 5. Comparison of suggested "Clean Sludge" composition with median pollutant concentrations in several recent surveys of sludge composition. Research findings summarized in the PRC report indicate that below the "Clean Sludge" limits, no cumulative limits are required for use of municipal sludges on cropland with no-adverse-effects.

POLLUTANT	Maximum in "Clean Sludge"	40-City Median	Mumma[1] Median
	-------------------	mg/kg	----------------
Aldrin	a	0.0049	-
As	1600	4.4	13.1
BaP	a	0.001	-
Cd	18	11.2	5.6
Chlordane	a	0.0049	-
Cr	1000*	248.	449.
Cu	1200	411.	761.
DDT	a	0.0049	-
Dimethylnitrosamine	a	0.28	-
Heptachlor	a	0.0049	-
Hexachlorobenzene	a	0.040	-
Hexachlorobutadiene	a	0.11	-
Pb	300**	266.	168.
Lindane	a	0.0049	-
Hg	a	1.7	4.3
Mo	17	13.2	6.5
Ni	500	70.1	55.4
Polychlorinatedbiphenyls	a	0.0049	0.26
Se	a	1.4	2.1
Toxaphene	a	0.0049	-
Trichloroethylene	a	0.53	-
Zn	2700	980.	1001.

[1] Mumma et al., 1988.

a These values need to be developed following a procedure similar to those we have outlined.

* No adverse effects reported at any municipal sludge Cr level. This value comes from Baker et al. (1985).

**For Pb Pathway 2F for D&M was utilized.

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NONAGRICULTURAL LAND APPLICATION OF MUNICIPAL SLUDGE

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SUMMARY

The EPA's approach of lumping all practices into one category and regulating on the basis of the 98th percentile is seriously flawed.

Nonagricultural land should be placed into two categories: 1) those sites which have a high potential for conversion to another land use, and 2) those sites which have a low potential for conversion to another land use.

Sites which have a high potential for conversion should be required to abide by the cumulative metal loading required for agricultural land and land conversion should not take place for 5 years after the last sludge application. Sites with a low potential for land conversion should be restricted to certain management practices regarding land slopes and public access.

The regulations for nonagricultural use of sludge should allow exceptions on a case-by-case basis when the POTW can demonstrate that additional management practices or controls other than those specified in the regulations would allow such exceptions.

By lack of statements to the contrary, EPA has taken the position that when analytical data for organics are reported as less than the limit of detection, the limit of detection shall be used to determine regulatory compliance. The PRC does not believe that this position is scientifically valid. The PRC therefore recommends the following approaches:

1. The EPA should establish acceptable analtyical detection limits for the organics based upon a study of analytical detection limits reported by 10 different laboratories testing 10 different sludges.

2. Any POTW reporting a limit of detection less than or equal to the acceptable limit of detection found in 1) above shall be considered to be in compliance with any EPA concentration-based regulatory limit.

3. Any POTW reporting a limit of detection less than or equal to the acceptable limit of detection specified in 1) above can use zero for the purpose of determining pollutant application rates.

4. Any POTW reporting a limit of detection greater than the accepted limit of detection in 1) above must use the actual limit to determine compliance with a concentration-based regulatory limit or the pollutant application rate.

EPA PROPOSED REGULATORY APPROACH

EPA chose to lump several practices into one category and refer to them collectively as nonagricultural land application. EPA conducted an aggregate risk assessment for nonagricultural land application which focused on two pathways: 1) surface runoff and 2) groundwater. The aggregate risk assessment, using worst case exposure scenarios, indicated that current practices are safe. Recognizing this, EPA then determined that a reasonable approach for regulating nonagricultural land application was to protect against extremely poor quality sludge being recycled by specifying "acceptable concentrations" in sludge based on a 98th percentile approach.

The PRC concluded that EPA's approach of lumping all practices into one category and regulating on the basis of 98th percentile concentrations was seriously flawed. These flaws are discussed and specific recommendations for regulating non-agricultural land applications are made in the following pages.

USE OF 98TH PERCENTILE APPROACH

EPA proposed numeric limits for sludge applied to nonagricultural land application. These limits are based on either a 98th percentile approach or concentrations derived from the agricultural land application pathways--whichever results in the higher number. Most of the parameters are controlled by the 98th percentile approach. The rationale for using a 98th percentile approach is arbitrary although several reasons have been suggested by various groups. These reasons include: 1) to encourage industrial pretreatment, 2) to insure that sludge quality does not get any worse, and 3) the approach satisfies groups that want some form of numeric limits in the regulation, while recognizing that nonagricultural land application does not pose significant human health risks.

None of the above reasons justifies regulating non-agricultural land application on the basis of 98th percentile concentrations. The 98th percentile approach will either over- or under-regulate. In cases where concentrations reported by POTWs for certain parameters are extremely low, as is expected for many of the organics, the 98th percentile approach over-regulates because even the highest concentration may be insignificant from a risk standpoint. In other cases the 98th percentile approach may under-regulate, allowing application of sludges with high concentrations of pollutants at rates that may pose significant risks.

In examining EPA's 98th percentile-based sludge pollutant limits, the PRC observed that the 98th percentile value was derived from the frequency distribution for each pollutant; that is, 2% of concentrations specified by the log-normal distribution for each pollutant would exceed the proposed limit. If pollutant concentrations are assumed independent, then the expected percent of POTWs having sludge which exceeds the 98th percentile for at least one of the regulated pollutants is $1-(0.98)^n$, where n is the number of pollutants regulated on the basis of the 98th percentile values. For nonagricultural land application, 13 pollutants are limited by 98th percentile values and 9 are less restrictively limited by the exposure assessment model. For these conditions, at least 23% of POTWs would be rejected. The PRC concludes that the 98th percentile-based limits are overly restrictive. Further, because larger POTWs tend to have more highly contaminated sludges, the 2% POTW rejection rate will result in a far greater than 2% sludge mass rejection rate. In fact, it is easy to see that if EPA just increases the number of pollutants to equal the priority pollutant list (129 pollutants), then about 93% of all sludges would be rejected based upon EPA's 98th percentile approach. Clearly, this approach does not meet EPA's stated objectives.

The PRC believes that the proposed 98th percentile-based approach has no technical merit, and recommends that this approach not be used in regulating nonagricultural land application. As a viable alternative, the committee recommends that EPA take the management practice approach discussed below.

RECOMMENDED REGULATORY APPROACH

Not all practices in nonagricultural land applications can be grouped into one category and still accurately reflect sludge uses and potential impacts. It is strongly recommended that EPA recognize the differences among these practices in the final rule.

Nonagricultural land application practices should be placed in two distinctive categories which more truly reflect the underlying premises for the proposed rule. These two categories are:

Category 1: practices in which the potential for future conversion and subsequent exposure are very low.

Category 2: practices in which the potential for conversion and subsequent exposure are high.

It should be the obligation of each POTW to provide the permitting authority with a clear statement regarding the relative likelihood of conversion. The permitting authority would make the final determination as to the likelihood of conversion.

Category 1: Low Potential of Conversion

The recommended approach for this category is to require a minimum list of sound management practices. Nonagricultural practices such as application to interstate medians, cemeteries, many forest systems, remote nonforest systems and remote land reclamation sites would generally be included in this category.

In addition to the management practices specified by EPA for nonagricultural land application, the committee recommends the following for Category I practices:

1) A setback distance be established from the sludge application boundary to a public or private drinking water supply well. Many state regulatory agencies (e.g., Wisconsin, Illinois, Ohio) require

setback distances from sludge application boundaries to drinking water supply wells. A common setback distance is 60 m.

2) Slope restrictions be maintained as generally given by the EPA Process Design Manual, EPA 625/1-83/016.

Slope	Comment
0-3%	Ideal; no concern for runoff or erosion of liquid sludge or dewatered sludge.
3-6%	Acceptable; slight risk of erosion; allow surface application of liquid sludge or dewatered sludge.
6-12%	Incorporation of liquid sludge required for general cases, except in a closed drainage basin and/or extensive runoff control. Surface application of dewatered sludge is usually acceptable.
12-15%	No liquid sludge surface application without effective runoff control; surface application of dewatered sludge acceptable, but immediate incorporation recommended.
15-30%	Application to forested sites with both good vegetative cover and slopes less than 30% is acceptable, provided that buffers around surface waters are required in the permit (as described in the EPA Guidance for Writing Case-by-Case Permit Requirements for Municipal Sludge, Sept., 1988). Application to slopes exceeding 15% should generally not be allowed during an extended wet season.

3) Restricted public access as per definitions of Class A, B, and C sludges in subpart F of the proposed rule. This means that the requirement under 503.16(d) should be eliminated. For the purpose of this rule, the committee recommends that public access could be restricted by virtue of remote location, fences, signs, or other appropriate means. This would require that appropriate changes be made in the definition of access restrictions for Class B and Class C sludges.

4) Hunting or foraging limitations should be consistent with the access limitation in 3) above. This should not preclude limited use of the site for those individuals who are informed of site conditions. The EPA's five-year preclusion for hunting or foraging for food as described in the Preamble is not supported by technical data. Studies have suggested that there is no accumulation of trace metals in the muscle tissue of wild animals (Haufler and West, 1985). Data have also shown no statistical difference in wildberry metal accumulations (Zabowoski and Zasoski, 1986). Furthermore, an unrealistic amount of berries would need to be ingested to accumulate excessive trace metals (Munger, 1983). Thus, it is unrealistic to assume excessive human exposure to pollutants from periodic ingestion of wildlife or other foods foraged from nonagricultural application sites (EPA, 1984).

5) For those practices where the primary goal of application is to provide nitrogen to a non-human food chain crop (silviculture, turf farm, etc.) sludge application should be based on the nitrogen requirement of the crop grown or other relevant pathways.

In certain situations, a POTW may wish to satisfy several years of crop nitrogen needs in single or multiple sludge applications. EPA should also consider allowing sludge applications higher than annual vegetation assimilative rates on a case-by-case basis. For these applications, an initial flux of nitrates may result in elevated groundwater nitrate nitrogen concentrations for a short period of time. However, it should not result in extended elevated nitrate nitrogen concentrations in the groundwater. These types of applications must consider the dynamics of the groundwater aquifer in determining the impact of this initial nitrogen flux (EPA, 1983; EPA, 1988).

6) For those practices where the primary goal is to provide additional organic matter, such as in land reclamation, application rates should not be based on nitrogen requirements. Although high application rates may result in initial nitrate concerns as in 5) above, the overall net benefits outweigh this concern.

7) The PRC strongly recommends that EPA allow for exceptions to all of the management practices on a case-by-case basis. Dedicated land application sites that are used to grow animal feed are examples of why the rule needs to provide a mechanism for case-by-case determinations. The proposed rule states that crops grown on nonagricultural land cannot be used for animal feed. However, these sites can be managed so transfer of pollutants to animal feed crops is lower than that allowed under agricultural land application. If sites were managed in this manner, there would be no scientific basis to prohibit the use of these crops for animal feed.

Category 2: High Potential of Conversion

Some nonagricultural practices such as application to forested sites located near urban fringes may have a high potential for conversion. The recommended approach for this category is to require several management practices as specified below:

1) Sound management practices as previously described for low potential conversion,

2) EPA should specify maximum pollutant mass loadings for metals. These should be consistent with the cumulative metal mass loadings specified for agricultural land application as amended by the recommendations described in the agricultural land application section of this report. These limits would also protect against potential conversion to agricultural or residential use. Annual pollutant mass loading limits for organics are not necessary if there is a specified land conversion period. A sufficient land conversion period would allow for degradation of most organics.

3) EPA specifies a 5-year waiting period for conversion of nonagricultural land application sites. The presumed underlying assumption made by EPA is that all sites have received high sludge loadings. Although the PRC generally agrees with the 5-year waiting period for conversion, the PRC recommends that exceptions be made to the 5-year conversion period on a case-by-case basis, because many sites may receive low sludge loadings or have other management practices which reduce the 5-year period or make it unnecessary.

EPA has expressed opposition to the use of management practices such as those recommended by the PRC for nonagricultural land application. However, many states have successfully used management practices as a regulatory mechanism for land application programs (e.g., North Carolina, Delaware, Maryland, Pennsylvania, Wisconsin).

ANALYTICAL LIMITS OF DETECTION

With the intensive sludge monitoring provisions for all practices, these comments are relevant across all proposed regulations.

The limit of detection can reasonably be defined as the lowest concentration that can be determined to be significantly different from a blank for that analytical test method and sample matrix. The limit of quantitation can reasonably be defined as the concentration of an analyte at which one can state with a reasonable degree of confidence (for a specific analytical test method and sample matrix) that an analyte is present at a specific concentration in the sample.

By lack of statements to the contrary, EPA has taken the position that when analytical data are reported as less than the limit of detection, the limit of detection shall be used to determine regulatory compliance. The PRC does not believe that this is an appropriate method for handling analytical detection data. EPA has shown reluctance to consider alternatives to this approach in the past because of the poor quality of data reported by the regulated community. The PRC recognizes this concern and recommends the following approach to address the detection limit issue:

1. EPA should establish an acceptable detection limit in sludge matrices for those parameters regulated under Part 503. Emphasis should be focused on the organics since detection limit concerns are less for the metals. The PRC recommends the following approach for establishing acceptable limits of detection. Based on data from the National Sewage Sludge Survey, EPA should select at least 10 sludges with varying solids contents which are known to have organic concentrations at or below the limits of detection. Samples of these sludges should be sent to 10 contract laboratories. Each contract laboratory should be required to establish detection limits for each organic parameter in each sludge matrix. Establishing detection limits in sludge matrices is extremely important because each sludge matrix is unique. Laboratories typically determine detection limits in water (with virtually no interferences) and apply these detection limits to sludge. Because of matrix interferences, detection

limits determined in sludges will be significantly different from those determined in water.

The resulting data base can then be used to determine an acceptable limit of detection for each organic parameter. A statistical procedure should be used to eliminate poor data points. It is the committee's understanding that the National Sewage Sludge Survey assigned specific analytical tasks to each laboratory used (e.g., one laboratory did all of the PCB analyses). Therefore, the National Sewage Sludge Survey cannot be used for the purpose of establishing acceptable limits of detection for the organics.

2. Any POTW reporting a limit of detection less than or equal to the acceptable limit of detection specified by EPA shall be in compliance with concentration-based numeric limits.

3. Any POTW reporting a limit of detection less than or equal to the acceptable limit of detection specified by EPA can use zero for the purpose of determining pollutant application rates. The two extremes are to use either zero or the detection limit value. Technically, neither is correct and the true value lies somewhere in between. However, use of zero to determine pollutant mass loadings seems to be appropriate because there would be no measurable increase in soil concentration resulting from an application under this scenario as a result of mixing in the top 15 cm of the soil. This mixing results in a 20-100 fold dilution of the sludge land pollutant. Thus use of zero is more appropriate.

4. Any POTW reporting a limit of detection greater than the acceptable limit of detection specified by EPA must use the reported detection limit to determine either compliance with a concentration-based numeric limit or the pollutant application rate.

MULTIPLE POLLUTANT CATEGORIES

Another major issue is how data in multiple pollutant categories is handled. This affects at least 3 pollutant categories: 1) aldrin/dieldrin, 2) DDD/DDT/DDE, and 3) PCBs. The current EPA practice is to add the individual limits of detection for each parameter within a category to get a total limit of detection for that category. This approach is not technically justified and may cause a larger number of unwarranted failures with regulatory numeric limits (either concentrations or mass loadings). A reasonable alternative to EPA's current approach when all parameters within a category are reported as less than the limit of detection would be to use the highest limit of detection for any individual parameter to determine regulatory compliance.

METHODOLOGIES

The proposed rule allows for alternatives to the isotope dilution methodologies (Methods 1624 and 1625) used in the national sewage sludge survey.

The committee feels that flexibility in the choice of analytical methodologies for all parameters should be preserved in the final rule.

MONOFILLS

For this municipal sludge disposal practice, the groundwater and the volatilization pathways have been identified by EPA as the most critical. These same pathways occur in many of the other reuse/disposal practices and thus the substantial criticisms offered here have relevance in other reuse/disposal practices.

Monofill Siting

Siting requirements for monofills with regard to unstable areas as given in 503.32 (1) of the rule are unclear. Unstable areas are presently undefined in the rule, but are discussed in the Technical Support Document. In the latter, unstable areas are defined to include landslide areas, areas with expansive clays, and areas with subsidence problems. This definition should be included in the rule.

There is a major philosophical flaw in the consistency of EPA's stated approach in regards to use of site-specific data. Many of the unstable areas cover large geographic regions. In Section 6.6.3, of the Technical Support Document, Landfilling Sewage Sludge, the proposed alternative for regulating the siting of monofills in unstable areas is to require the owners/operators to perform geotechnical studies of all proposed sites to demonstrate that unstable conditions do not exist at the site. These studies would require that subsurface investigations be performed and geotechnical characterizations of various strata be made; in other words, site-specific information is required. However, the current philosophy for developing the contaminant transport models is that site specific data are not required. Because a geotechnical site investigation removes the need for using the hypothetical site conditions, at least in terms of stratigraphy, the current philosophy appears flawed. The PRC believes that incremental costs for developing site-specific parameters for the transport models would be small, and the resulting benefit of more accurate representation of the contaminant transport scenario would be large.

Air Modeling Issues

The principal limiting monofill pathway was organic losses to the atmosphere. The same models, assumptions, and rationale occur in other sludge practices. Thus, the comments offered here are important across the entire proposed rule package.

Serious inconsistencies exist in the air quality modeling approaches. In the SLAPMAN model for land application, the assumption that 100% of a chemical volatilizes, and simultaneously, 100% of the chemical leaches, is impossible. This assumption violates mass balance principles and goes beyond a conservative approach to one that is totally indefensible. A similar inconsisitency exists in the SLUDGEMAN model for monofills, which partitions chemicals to the vapor pathway using a Henry's Law constant (K_H). Using only K_H to partition chemicals to the air greatly overpredicts the amounts volatilized because considering only the air-water partitioning ignores other important processes such as adsorption and the water content of the sludge/soil. The committee recommends that partitioning to the air pathway for both models be computed using the relations developed to predict volatile chemical partitioning from soils:

$$\frac{C_g}{C_t} = \left[\frac{Kd \cdot Bd}{K_H} + \frac{N_w}{K_H} + N_t - N_w \right]^{-1}$$

where C_g = concentration of chemical in gas phase,
C_t = concentration of chemical in soil/sludge,
Kd = soil-water partition coefficient,
Bd = bulk density of the soil/sludge,
K_H = dimensionless Henry's constant,
N_t = total porosity,
N_w = water filled porosity.

The air models for land application and monofills overpredict exposure as a result of their assumptions. For example, the MEI is assumed to remain continuously in the plume for 70 years and to breathe only the contaminated air. In addition, the mixing zone is assumed to be 1 m thick.

The committee recommends that EPA use better air dispersion models that have been developed and used in other programs, such as the model used for incineration, to give improved predictions of risk from air exposure. However, if the simple models are used, more realistic and reasonable assumptions should be incorporated in the models, such as a 2 or 3 m mixing zone for the air concentrations and long-term average atmospheric conditions. Also, the committee does not believe the MEI can be continuously exposed for 70 years, and recommends that the exposure time be adjusted to a more reasonable duration.

Another inconsistency is that the two most volatile compounds, benzene and trichloroethylene, are excluded from consideration in the air pathway modeling, but are included in the leaching pathway to groundwater. The rationale given by EPA is that these compounds are so volatile that they are lost from the sludge in the digestion, drying, handling, etc. and therefore are not present in the sludge in significant amounts and can be ignored. If this is true, they should also be ignored in the leaching pathways. The PRC recommends that EPA adopt a consistent approach for handling these volatile compounds.

Groundwater Modeling Issues

An analytical model is used by EPA to evaluate contaminant migration from monofills. A similar model is used for land application practices. The criticisms of the SAB regarding groundwater modeling were largely ignored by EPA. The PRC believes SAB was correct in criticizing the model, and offer additional comments which should be considered by EPA.

Specifically, EPA recommends using the program SLUDGEMAN (EPA, 1989b) to evaluate the groundwater pathway for monofills. In SLUDGEMAN, transport through both the unsaturated and saturated zones is modeled by combining several existing computer codes. Unsaturated flow is evaluated using the CHAIN code. The code MINTEQ is used to calculate metal ion reactions at the interface between the unsaturated and saturated zones. Output from CHAIN is used as input to AT123D, the saturated flow model. The program SLAPMAN (EPA, 1989a) is used to evaluate the groundwater pathway for land application and distribution and marketing of sewage sludge. In SLAPMAN, flow through the saturated zone is not considered.

Unsaturated zone

Modeling unsaturated zone chemical transport is accomplished with CHAIN, an analytical solution of the advection-dispersion equation that describes chemical movement through a homogeneous soil profile under constant (steady-state) water flow conditions. The PRC understands the reasons such a model was selected; it demands limited input information and is easy to program and execute on a desk-top computer. However, the PRC recommends that use of CHAIN be discontinued for the following reasons:

1. CHAIN assumes a constant flow of water through the soil. However, this assumption prevents the use of CHAIN for estimating solute flux under transient field conditions that will be present in all instances of sludge disposal where there is an unsaturated zone between the bottom of the disposal area and the top of the water table.

2. CHAIN simulates transport through a single homogeneous soil stratum and is incapable of describing layered soils. It cannot describe the behavior of engineered liner systems such as a compacted clay liner with a granular leachate collection system. Current understanding is that many of the input parameters assumed constant in CHAIN, e.g., Kd, decay rate, and water flow properties, are in fact spatially and temporally variable in nature. Additionally, versions of SLUDGEMAN and SLAPMAN average the input data to estimate an average homogeneous soil of one layer. The current version of the model, which requests input by layers, is deceptive in this regard. Consider a synthetic liner which is essentially impermeable (e.g., 10 mil thick and 10^{-8} cm/s hydraulic conductively) overlying 50 ft of sandy soil at 10^{-3} cm/s hydraulic conductivity. The model asks for layer-by-layer information and then calculates an average for the pertinent parameter. In this case the average hydraulic conductivity is nearly 10^{-3} cm/s, yet in reality practically no water moves past the liner if it has been properly installed. This deceptive calculation is particularly critical because the field reality is so obviously disregarded. The same technique is used for chemical adsorption, and fails to

recognize that a thin clay layer can dramatically alter heavy metal behavior. The PRC believes that the ability to adequately model the effects of distinct soil strata should be present in the model.

3. Application of the model MINTEQ at only the saturated-unsaturated zone interface may result in large over-estimations of the metal movement to the saturated zone. A more representative procedure would be to calculate metal ion reactions at appropriate positions (node intervals, layers) along the travel path in the unsaturated zone. Alternative modeling approaches, as described below, can incorporate such calculations. The current neglect of any metal reactions in the bulk of the unsaturated zone prevents the removal of any metals from solution before reaching the groundwater. Hence the total mass delivered to the interface is greatly overestimated.

In SLUDGEMAN, EPA converts the output of CHAIN into a square wave for input to AT123D. However, the process, as contained in the current computer code, can dramatically overestimates the total mass of metal or organic in the system to the point where more mass may enter the groundwater than is put into the monofill.

5. EPA's sensitivity analysis of SLAPMAN and SLUDGEMAN lacks credibility. Their sensitivity analysis is an analysis of model sensitivity, not process sensitivity. A number of assumptions have been made in adopting CHAIN or AT123D that greatly simplify natural processes. The resulting models are not useful to test the sensitivity of the natural system. Rather, the sensitivity analysis that is accomplished is only useful in testing the sensitivity of the presumed (and incorrect) models.

Alternate modeling approaches to CHAIN exist for use in unsaturated soil under transient field conditions. The PRC recognizes the need for any alternative model to not be overly data-demanding. However, EPA must recognize that soil-water-chemical systems are complex, and must be characterized, if even to a minimum extent, if site-specific leaching assessments are to be made. The PRC recommends that the model PRZM (produced by EPA), RUSTIC (evolution of PRZM), LEACHM (Cornell University), or some similar approach be strongly considered as core models in revised editions of SLAPMAN and SLUDGEMAN.

Alternative modeling approaches for the unsaturated zone will better estimate concentrations of chemical moving into the saturated zone. This is true whether the sludge is disposed of in monofills or recycled to agricultural or nonagricultural land. In conjunction with the revised unsaturated zone models, conversion of calculated unsaturated zone concentrations into a square wave for input to the saturated zone model must be accomplished using a revised procedure that conserves total mass.

It seems unnecessary to even use CHAIN to estimate loading to groundwater when one considers that (1) CHAIN can be used only under monofills over short distances (about 1 meter), and (2) information on delivery to groundwater is required only in terms of an approximated square wave. For such short distances a calculation can be accomplished with the required accuracy without any model by assuming an exit leachate concentration from the landfill and an appropriate retention factor. Beyond a distance of 1 m to the saturated zones (typical of the vast number of landfills), CHAIN is not realistic and is subject to the PRC's and SAB's criticisms. The committee also recommends that geologic, hydraulic and chemical site-specific parameters be developed for each monofill.

Saturated zones

The AT123D model for steady state saturated flow is an analytical model that simulates advective-dispersive contaminant transport. In the AT123D code, advection is limited to one-dimension, while dispersion is allowed to occur in three dimensions. Sorption and contaminant decay are also considered in this model. Because the model uses an analytical solution, the flow and chemical input parameters are taken as constants. Both the heterogeneous character of porous media and the travel distance of 150 m assumed by EPA make it difficult to select K_{sat} and dispersivity values that are representative of in situ behavior, much less to select a functional dependence of the parameters. Thus the major problem is parameter identification. Because the main mechanisms of transport are modeled adequately in AT123D, the committee recommends that AT123D be used for contaminant transport through saturated porous media. However, the square pulse input from the unsaturated flow model must be one that maintains conservation of mass from one regime to another.

The SLAPMAN land application model assumes that sludge leachate migrates through the unsaturated zone to groundwater at 1 m below land surface. No dilution by the groundwater is allowed. This is an unreasonably restrictive and unrealistic constraint. Even a conservative estimate of groundwater concentration would allow mixing with some depth of groundwater. The PRC recommends use of the AT123D model (as used in the landfill modeling) or use of a conservative dilution depth under the land application area. Either option would still be very conservative because no one would use a very shallow well for drinking water. A drinking water well would normally be greater than 15 m deep to prevent pathogen contamination from septic tanks.

If the EPA adopts a setback distance for drinking water supply wells for non-agricultural land application of sludge, then the SLAPMAN model is inadequate to realistically model the pathway because it contains no provisions to model saturated flow. With a setback requirement, a minimum distance of saturated flow can be counted upon to provide dilution of the contamination. A corrected version of SLUDGEMAN should be used to more accurately model this pathway.

Leachate concentration

The monofill model assumes concentrations of contaminants in sludge leachate as given in Table 3-7 of the Technical Support Document on Landfilling of Sewage Sludge. These values were not all obtained from sludge leachate compositions as inferred, but were actually obtained from a variety of sources including sewage effluents containing particulates. As such, they are grossly in error for some constituents and include values that are orders of magnitude larger than even the water solubility of the compound. We recommend that conventional partitioning be incorporated in the model as given as Option B in

Appendix A of the Technical Support Document. Leachate concentrations are easily computed from sludge concentrations and Kd values.

The PRC recommends that, whenever possible, site-specific Kd values be used in the analysis. In lieu of site-specific data, sludge-metal Kd values are available in the same reference reported as the source of the sandy soil-metal Kd values. Sludge-organic contaminant Kd values can be determined from the organic carbon content of the sludge and the K_{oc} values for the individual contaminants listed in the support documents. The PRC recommends the same partitioning approach be used to compute leachate concentrations for surface application of sludge in the SLAPMAN model. However, with the use of an average Kd for the entire profile calculated by averaging separate layers, the actual sequential effect of high Kd layers is lost.

A further assumption in the monofill model is that the entire metal content of the sludge will exit the disposal site in a square pulse of uniform concentration. There is no scientific justification for this assumption. Both empirical observations and theoretical considerations indicate this assumption to be invalid and overly restrictive. Field observations at landfills indicate that the initial leachate concentration decreases over time. Based on Illinois State Geologic Survey data, the decrease in concentration can be estimated using a first-order decay rate with a 6.5-year half-life for the most mobile constituents. The PRC recommends that a first-order decay expression be incorporated into the model to yield more realistic estimates of the contaminant loadings to the groundwater flow pathway.

Model input data

The validity of the input data to all models must be carefully considered by EPA. Some of the most sensitive input parameters are Kd, decay rates, K_H, dispersion coefficients, and saturated hydraulic conductivity. The committee recommends the use of site-specific input values whenever possible and flexible computer model input requirements. "Hard wired" model parameters should not be used because literature values for some parameters such as K_H and decay rates can vary over several orders of magnitude. Careful evaluation of model input parameters must be carried out and the models must be able to accept new data as they become available.

The Kd values listed in Table 3-8 of the Technical Support Document, Landfilling Sewage Sludge, are unrealistically conservative. They were computed using an organic carbon fraction (f_{oc}) of 0.0001. Such organic carbon contents would only be found in clean beach sands, and are not typical of any other types of soil that could be found under a sludge application or disposal site. The committee recommends use of f_{oc} values 5-10 times higher (i.e., f_{oc} of 0.001 to 0.0005).

Default data for unsaturated and saturated water flow parameters given in the Technical Support Documents, Landfilling Sewage Sludge, for use in SLAPMAN and SLUDGEMAN are inconsistent, and, in some cases, in error. These data appear in Tables 3.1 and 3.4 and as default input to the two computer codes. For example, the worst case scenario of geologic conditions beneath a sewage sludge landfill is assumed to be sand. Default values of effective porosity, N_e, and saturated hydraulic conductivity, K_{sat}, of sands are assigned to be 0.34 and 3200 m/yr, respectively, in SLAPMAN. In contrast, SLUDGEMAN's default values of N_e and K_{sat} are 0.1 and 2000 m/yr, respectively, and are used for saturated flow as modeled by AT123D. This latter N_e value is low by a factor of four and is more representative of sandstone than sand. Because these material parameters are for the same assumed soil, they should be the same values no matter where they are used in the computer codes. However, because geologic media are so variable across the U.S., EPA's use of a single value of K_{sat} for each soil type is simplistic and indefensible. A better approach would be to give ranges of K_{sat} for each soil type in the Technical Support Document to provide a user with a reasonable sense of the uncertainties involved with a non-site specific parameter. Moreover, site-specific K_{sat} can be determined in many ways, the best estimates are obtained from results of field pumping (granular soils) or ponding (cohesive soils) tests. In order of decreasing confidence of parameter identification, K_{sat} values may also be found from borehole permeability tests, laboratory tests, and empirical correlations with grain size.

Other comments concerning the technical data base as related to the computer models as described in the Technical Support Documents and User Manuals include:

1. There appears to be a conceptual or sign error in the derivation of Eq. (4) in Chapter 2 in the Technical Support Document, Landfilling Sewage Sludge. More details on this derivation should be provided. It appears to the reviewers that a more reasonable relationship would be derived as:

$$T = \frac{1}{d} \ln \frac{XR}{XR + dM_i}$$

where M_i = initial mass in the system, kg,
T = pulse time (yr)
d = degradation rate constant, yr^{-1}
X = leachate concentration, kg/m^3
R = recharge rate, m^3/yr

2. Presentation of Eq. (5) in Section 2 of the Technical Support Document, Landfilling Sewage Sludge, is meaningless without further description of how it is used in the model. A number of further simplifying steps are invoked in order to utilize K_{sat}, the slope of the moisture release curve and other related variables.

In addition to hydrologic and chemical input parameters mentioned before, one additional item needs to be clarified as to the input data to AT123D. Selection of the mixing depth of the leachate in the aquifer is not adequately described in the Technical Support Document. Guidance should be given based upon results of field studies (i.e., MacFarlane et al., 1980) or results of computer simulations of two-dimensional advective flow to give a potential user some guidance in this selection.

Other Issues

1. EPA failed to consider the potential for nitrogen contributions to groundwater from monofills. Sikora et al. (1978, 1979, 1980) mentioned that the lightly loaded trenches in their studies contained an average nitrogen loading of 10,000 kg/ha. For a landfill containing a 2 m deep layer of 20% sludge cake containing 3% nitrogen, the nitrogen loading is approximately 122,000 kg/ha. Thus a potential nitrogen problem could exist at monofills and needs to be addressed.

2. EPA does not differentiate between trench monofills and area monofills. Conditions under area monofills are likely to be anaerobic. This is generally not the case for trench systems. This difference will have a significant impact on transformation and loss of nitrogen.

The PRC recommends that the EPA differentiate between trench monofills and area monofills because of the differences in the potential for leaching from these types of monofills.

3. There is some indication that there is no significant leaching of metals from trench systems (Sikora et al., 1978, 1979, 1980). EPA should consult this information before the regulations are finalized.

4. 503.32(f) of the Federal Register. It is the experience of municipal sludge management agencies that municipal sludge placed in a monofill with daily cover does not attract birds. Sludge is distinctly different from municipal garbage or solid waste. The siting requirement with respect to airports should be eliminated. These requirements appear to have been inserted from other regulations without recognition of differences in landfill wastes.

5. 503.32(g) of the Federal Register. It is required that sewage sludge units be designed to withstand the maximum recorded horizontal ground surface acceleration. In the Technical Support Documents, procedural guidelines to evaluate stability of the monofill are suggested. This requirement is inconsistent because there are no guidelines to design the cut slopes of the monofills under gravity loading conditions. Once again if even a superficial geotechnical investigation is made to evaluate either gravity or earthquake loadings of the monofill's excavated slopes, then there is no reason not to develop other, more important, site-specific data.

6. The need for the Class B pathogen standard in a properly sited monofill does not appear justified. Migration of pathogens, under any realistic design standards within these proposed regulations, is very unlikely. The PRC recommends the Class C pathogen standard for sludge placed in monofills.

SURFACE DISPOSAL SITES

Definitions and Approach

The current definition of surface disposal must be modified to reflect the operational difference between storage with no intent for further management and storage as an essential component in an overall sludge management scheme. This can be achieved with a minor change in the definition of surface disposal.

EPA defines surface disposal as impoundments, bermed facilities or piles where the intent is not treatment (e.g., dewatering) or temporary storage, but disposal. EPA further states that storage for longer than one year is considered as disposal. The PRC recommends that if the material is to be removed for ultimate reuse/disposal within 3 years, that the practice should not be considered surface disposal. The PRC also recommends that exceptions to the 3-year time period be allowed on a site-specific basis. This definition recognizes that temporary storage for periods longer than one year is often required to efficiently manage sludge reuse/disposal programs. Storage longer than 3 years would generally imply little intent of further management, and thus would be regulated as a surface disposal unit. Further, the PRC recommends that lagoons operated as fill-and-draw units or treatment units for sludge should not be considered as surface disposal units.

EPA intends to adopt a risk assessment model for surface disposal. The PRC supports a risk based approach. It is assumed that the risk based approach would draw heavily on the approach used for monofills.

Other Issues

1. 503.44(a) (1)-(4) of the rule. EPA requires monitoring for methane at surface disposal sites. This may be logical at municipal solid waste landfills where daily cover and a clay cap at closing prevent free exchange of gases with the air. However, because daily cover and clay caps are not used at surface disposal sites, free exchange of gases with the air will occur. Under this condition methane will not build up to excessive levels. The committee recommends that the methane section should be eliminated from surface disposal.

2. 503.45 of the rule. If there is no intended use of the sludge as provided by the definitions given for surface disposal, requiring Class A and B pathogen reduction is unjustified. Sludge should not be regulated for use if it is not intended for use. This undermines the concepts and emphasis being proposed in describing municipal sludge practices.

3. 503.42 of the rule. It is the experience of municipal sludge management agencies that sludges processed to reduce vector attraction do not attract birds. Therefore, there is no need to regulate the placement of surface disposal sites based upon distance from airports.

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DISTRIBUTION AND MARKETING

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SUMMARY

The proposed rule on D&M is unique. Although the exposure scenarios used to calculate risk estimates and to determine pollutant loading limits are similar or identical to those in AgLA and NonAgLA, the approach to regulate, however, is quite different. Instead of relying entirely on the specific numerical value of pollutant loading limits, EPA imposed several policy/ administrative requirements which would severely hinder the D&M of sludge and sludge products. While we attempted to point out the technical deficiencies of the D&M proposals, a large part of the problem with D&M regulation was the result of EPA's policy decisions. Unless these decisions are reviewed and modified, the inherent flaw of the proposed D&M rule can not be remedied simply by revising the risk and exposure computations.

In light of comments and suggestions on improving the risk assessment methodology and exposure and risk estimation for both AgLA and NonAgLA, it seems prudent that EPA also review its approaches proposed to regulate D&M sludge products.

INTRODUCTION

The risk assessment and exposure scenarios used for regulating Distribution and Marketing (D&M) of sludge products in the proposed rule were a subset of those used for the Agricultural Land Application (AgLA) option. The D&M workgroup recognized that the AgLA workgroup was providing a thorough evaluation of the input data selected and assumptions used for these pathways. Therefore, we did not attempt to duplicate their efforts by conducting separate evaluations. We fully support the evaluations of and conclusions for pathways 1, 2, 7, 8, 9, and 11 reached in the AgLA and NonAgLA sections. These pathways and their results were the basis of setting pollutant loading limits for D&M.

The D&M workgroup focused its efforts mainly on "questions" posed in the D&M portions of the preamble of the proposed rule. A point-by-point response to these questions is presented in this report. The "responses" provided also include wherever applicable, the diverging opinion of one member who did not agree with the other five members of the D&M workgroup on several points.

Upon answering the questions posed in the preamble, we were not satisfied that our concerns on the assumptions made in the exposure and risk analysis and technical correctness of the results were fully expressed. We therefore went ahead to engage in more comprehensive discussions and identify other issues. Unlike the proposed regulations of other sludge management options (e.g., AgLA, NonAgLA, and monofills and surface disposal), whose numerical limits on specific pollutants are directly extrapolated from results of the risk assessment computations, the regulations of D&M involve extensive administrative (policy) decisions in regard to labeling, performance agreements, and quality control and quality assurance requirements.

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[1] The D&M workgroup acknowledges the valuable suggestions/comments and contributions received from the following individuals during the drafting of this section: Truett Garrett, Jr., Kathryn Kellogg, Daniel Landis, Henry Leibee, and James Spindler.

These decisions, made by the EPA, are strictly judgemental and cannot be disputed or supported by scientific arguments. But they have far-reaching impacts on the D&M of sludge products. In our opinion, the EPA did not conduct an adequate background data gathering effort nor nationwide survey to fully understand this industry. Many requirements are academic in nature, difficult to enforce for the regulator and impractical for the industry to implement. Since the technical issues which concern D&M are similar to those of the other review groups, particularly AgLA, and were dealt with in depth by these groups, we focused on the implications of EPA's policy decisions.

D&M QUESTIONS POSED BY EPA

1) Sewage sludge products are included within the definition of sewage sludge no matter how small the percentage of sewage sludge in the product. Are there products that contain so small a percentage of sewage sludge that they no longer have the characteristics of sewage sludge? If so, should these be excluded from the definition?

Response Our understanding is that current Federal regulations do not regulate any sludge product marketed in the U.S. The definition for "sludge" in the proposed rule would include all products containing >0% sludge, necessitating their regulation. To include all sludge-derived products, such as the examples listed in Table 1, would discourage these beneficial reuse practices by placing an unnecessary requirement for extra labeling and an unnecessary burden of chemical analysis on distributors, re-blenders, etc. who receive D&M sludge/sludge products for distribution. As an example, one product listed in Table 1 contains 5% heat dried sludge with the rest of the product composed of sulfur-coated urea, superphosphate and potassium sulfate. This product is basically a fertilizer (6-8-12) used for turf fertilization. The rate of application is strictly governed by its nutrient value which would likely be less than 200-300 kg/ha. At this rate, the amount of sludge applied would be 10-15 kg/ha, hardly enough to present any human or environmental hazard. Yet, under the proposed rule, this product would now have to be regulated as a sewage sludge rather than as a fertilizer. We are not sure that the EPA intended to include all such products under the proposed rules.

We recommend that EPA develop a standard for "clean sludge" which the generator of the sludge or sludge product must meet before these materials are passed along to distributors, re-blenders, etc., because of divergent end uses of sludge products and difficulties in tracking

D&M products. By using such a mechanism, the labeling provisions and quality control, required by the proposed rule, would hold the sludge generators accountable but would not pass the regulatory burden along to products manufactured by the distributors, re-blenders, etc.

2) For D&M, specific numerical limits for 22 pollutants, (Federal Register, Feb. 6, 1989 Table III-4, p. 5761) are proposed. Are there any pollutants, not included in this group, which should be evaluated immediately? Are there some chemicals which should be deleted from this group of 22 pollutants?

Response The AgLA workgroup has suggested that fluoride (F) and iron (Fe) be included, and we concur. We also suggest that some pollutants could be selectively deleted for two reasons. First, we question whether banned pesticide chemicals (e.g., aldrin, chlordane, DDD, DDE, DDT, dieldrin) need to be included among those selected for evaluation, unless the National Sewage Sludge Survey (NSSS) data suggest that sludges contain significant concentrations of these chemicals. Previous summaries (Jacobs et al, 1987) suggest that median concentrations of these organics are generally less than 1 mg/kg of dry sludge solids.

A second basis for deleting a pollutant occur when exposure assessment pathways show no significant risk. For example, three organic compounds (chlordane, hexachlorobutadiene, lindane) evaluated for D&M pathways (Table 6-1, p. 6-3 in the TSD) suggest that the most limiting annual whole sludge application rate (AWSAR) for addition of each organic is 32.2, 41.0, and 917 kg/ha, respectively. When these allowable loadings are converted into allowable concentrations in sludges for different sludge application rates of 1 to 50 mt/ha, ridiculously high concentrations are obtained compared with the levels normally found in sludges. The following table illustrates this point and provides more than a reasonable basis to exclude each pollutant from the pollutant list and make the regulations for D&M more credible.

Concentration[a] Allowed at the Following					
	Sludge Rates (mt/ha):				
Pollutant	1	5	50	500	Median Sludge Concentration[b]
	mg/kg				
Chlordane	32,200	6,400	640	64	2.75
Hexachlorobutadiene	41,000	8,200	820	82	0.036
Lindane	917,000	183,400	18,340	1,834	0.18

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[a] Concentration values taken from Table 6-2, p. 6-4 of TSD except for values for 500 mt/ha rate which were calculated. (Values given in Table 4, p. 5882 of proposed Rule, for Chlordane and Lindane are somewhat lower, for some unexplained reason.

[b] Highest median value reported by Jacobs et al (1987) from among sludge analysis data cited.

TABLE 1. Examples of D&M Sludge products currently marketed without federal regulations which would require regulation under "sludge" definition of proposed 40 CFR Part 503 sludge technical standards.

Product Name	Nutrient[a] Analysis	%	Non-Sludge[b] Sludge	Components/Uses of D&M Product
			Products Using Composted Sludge	
Nitrohumus	0.75-1.5-0	40	Wood products	Soil conditioner
Amend		11	Proprietary mix	Vegetable planting mix
Gromulch	(0.1-0.5 N)-	18	Proprietary ingredients	Planting mix, trees, shrubs
Topper	(0.2-1.4 P_2O_5)-	24	Wood products	Seed cover & soil amendment
Azalea/Camellia	(0.1-1.2 K_2O)	10	Proprietary ingredients	Planting azaleas/camellias
African Violet Mix		5	Proprietary ingredients	Planting African violets
Potting Soil	1.35-0.2-0.85	5	Proprietary ingredients	Potting medium
Compgro	3.0-2.5-0.1	40	60% Fir bark	Soil conditioner
Gen. Landscape Soil		25/10[c]	Soil plus fir humus	Topsoil for ornamentals
Rhododendron Blend		10/4	Soil plus proprietary	Acid loving plants
Turf Blend		33/13	Soil plus proprietary	Establishing Lawns
Turf Top Dressing		50/20	Soil plus proprietary	Lawn maintenance (1/4 in.)
Multi-Purpose Mix		18/7	Soil, sand, vermiculite	Home container plantings
Nursery Mix (Special)		20-30/8-12	Soil plus proprietary	Nursery special potting
Tropical Mix		15/6	Soil plus proprietary	Special mix large scale indoor
Ultra-Light		20/8	Soil plus volcanic sand	High-rise containers
50/50 Blend	1.5-1.5-1.0	50/20	Fir humus	Soil amendment
Clodbreaker w/ Compgro		30/12	Volcanic sand, expanded	Conditioner for clay soils shale
Mil-Chem (PA)	22-4-8+1% Fe	28	Urea, DAP, KCl	General turf fertilization
Mil-Chem+weed contr	22-4-8	23	Urea, DAP, KCl	General turf fertilization
Mil-Chem	12-4-8+2% Fe	63	Urea, DAP, KCl	General turf fertilization
TIECO Brands (SC)	14-3-8+2% Fe	51	? or Proprietary	General turf fertilization
TIECO Brands (SC)	15-3-8+2% Fe	50	? or Proprietary	General turf fertilization
TIECO Brands (SC)	17-3-8+2% Fe	45	? or Proprietary	General turf fertilization
TIECO Brands (SC)	24-2-8+1% Fe	25	? or Proprietary	General turf fertilization
Rockland Chemical Co. (NJ)				
Mil-An-Chem I	12-4-8+2% Fe	63	Urea, DAP, KCl	General turf fertilization
Mil-An-Chem II	22-4-8+1% Fe	28	Urea, IBDU, KCl, DAP	General turf fertilization

TABLE 1. (continued)

Product Name	Nutrient Analysis	% Sludge	Non-Sludge Components	Uses of D&M Product
			Products Using Heat Dried Sludge	
Spring Valley Turf Products (WI)				
Natural Green "Spring"	20-2-8+TEAM+1% Fe	25	Urea, SCU, DAP, KCl, Ammonium sulfate, TEAM	General turf fertilization plus crabgrass control
Natural Green "Summer"	25-2-4+1% Fe	25	Urea, SCU, DAP, KCl, Ammonium sulfate	General turf fertilization
Natural Green "Fall"	12-12-20+1% Fe	25	Urea, DAP, KCl, Ammonium sulfate	General turf fertilization
Water Saver & Hydro-Wet	10-1-0+2.5% Fe	63	Ammonium sulfate plus proprietary	General turf fertilization
Milorganite Pro "Spring" + TEAM	20-2-5+1.5% Fe	40	Urea, SCU, DAP, K_2SO_4, Nitroform, TEAM	Golf turf fertilization plus crabgrass control
Milorganite Pro "Summer"	20-3-6+1.5% Fe	40	Urea, DAP, K_2SO_4, Nitroform	Golf turf fertilization
Milorganite Pro "Fall"	10-5-15+2.0% Fe	50	Urea, SCU, DAP, K_2SO_4, KCl	Golf turf fertilization
Milorganite Pro	13-2-4	37	Urea, K_2SO_4	Golf turf fertilization
Golf Pro	12-4-8+2.0% Fe	50	Urea, MAP, K_2SO_4, Nitroform	Tees & greens fertilization
Golf Pro	6-1-12+2.4% Fe	65	Nitroform, MAP, K_2SO_4,	Greens fertilization
Golf Pro	5-1-10+2.5% Fe	70	Nitroform, K_2SO_4, Hydro-Wet	Golf turf fertilization
Flower Bed Planter	6-12-8	41	Nitroform, K_2SO_4, Triple super phosphate, Hydro-Wet, Gelscape	Flower bed fertilization
Confidential	21-7-7	36	SCU	Professional lawn fertilization
	21-7-7	31	SCU, Sul-Po-Mag	Professional turf fertilization
	21-7-7	9	SCU	Turf fertilization & broadleaf control
	21-7-7	23	SCU	Turf fertilization & crabgrass control
	6-8-12	5	SCU, Superphosphate K_2SO_4	Turf fertilization
	10-6-4	75	Urea, KCl	Professional lawn fertilization
	7-7-7	11	? or proprietary	All purpose fertilization
	10-2-4	13	? or proprietary	Tree & shrub fertilization
	3-11-0	50	Superphosphate	Bulb fertilization
	12-10-10	3	? or proprietary	Evergreen fertilization

TABLE 1. (continued)

Product Name	Nutrient Analysis	% Sludge	Non-Sludge Components	Uses of D&M Product
			Products Using Heat Dried Sludge (continued)	
Sunniland Turf-Gro Products	16-3-12	9	NH_4NO_3, ? or proprietary	Golf greens fertilization
	15-0-15	13	? or proprietary	Golf greens fertilization
	10-10-10	45	? or proprietary	General fertilization
Lykes Fertilizer Co. Lakeland, FL	custom blend	10	Commercial fertilizers	Citrus crops
Florida Favorite Lakeland, FL	custom blend	10	Commercial fertilizers	Citrus crops
			Products Using Air Dried Sludge	
Hi-K	custom blend	80-90	Urea, K_2SO_4, phosphate	Turf fertilization
666	custom blend	80-90	Urea, K_2SO_4, phosphate	Turf fertilization
All purpose	custom blend	80-90	Urea, K_2SO_4, phosphate	Lawn & garden fertilization
KARE fertilizers	custom blend	80-90	Urea, K_2SO_4, phosphate	
(Several different products are made for: blooming plants, new plantings, roses, camellia/azalea, tomatoes/vegetables, citrus/fruit, grass lawns, etc. under the "KARE" label.)				

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[a] Concentration of N, P_2O_5, and K_2 as percent dry weight.

[b] DAP = diammonium phosphate; KCl = potassium chloride; IBDU = isobutylidene diurea; SCU = sulphur-coated urea; MAP = monoammonium phosphate; TEAM = crabgrass preventer.

[c] A number of products contain Compgro/sludge mixtures. The %Compgro and %sludge in each product are given as numbers separated by a slash, i.e., 25% Compgro/10% sludge.

3) The MEI scenario for D&M is a rural non-farm family growing 60 % of their fruits and vegetables in a sludge-amended home garden. Is this scenario for the MEI reasonable? Does it reflect a scenario which could occur?

Response The MEI scenario does not reflect a probable occurrence for D&M products. The majority of D&M products are utilized within urban environments which, by their nature, would be more restrictive relevant to the size of garden areas that people could be expected to use for home-grown vegetables. In rural areas, other sources of readily available and "less expensive" organic amendments (e.g., animal manure, crop residues, etc.) undoubtedly compete for the same outlet with municipal sludges. The costs of bagged sludge compost products are likely to discourage anyone from using D&M sludge products in quantities needed to support the exposure scenario of the MEI. To produce the quantity of food to satisfy dietary requirements of the MEI, approximately 1,000 m^2 of land per capita is needed (figure estimated by R. Horvath). If a sludge product,such as Kellogg's Nitrohumus (Carson, CA) were applied at the 50 mt/ha/yr, 200 bags of this material would be needed at the cost of about $1,000 per year. The likelihood of any gardener purchasing this much D&M product annually is questionable.

The exposure scenario which leads to the MEI of D&M products is entirely hypothetical. Whether this scenario would ever occur is obviously speculative. More importantly, the probability that such an event may take place is unknown. In order to project risk, it is essential that one starts with a reasonable realistic exposure scenario and is able to determine the uncertainty associated with the risk estimate. Based on information provided in the TSD, we are not sure that the uncertainties of the risk estimate, in this case, are quantifiable. As the rule "shall be adequate to protect public health from any reasonably anticipated adverse effects of each pollution" [Section 405 (d) and (e) of Clean Water Act], it is perhaps appropriate to assume a reasonable exposure scenario.

Therefore, we recommend that the MEI be "an urban resident with considerably less than 60% of the fruits and vegetables in his/her diet being grown on D&M amended soils. We see this MEI as a more plausible one for D&M than the one proposed.

4) Three "key parameters" were used in exposure assessment models or as a basis to exclude certain pathways from consideration:

a) raising animals for human consumption, or growing feed crops for animals raised for human consumption, would not be done on sludge-amended soils for the D&M MEI home garden scenario;

b) the background concentration of metals in the soil corresponds to the average soil concentration of rural agriculture land; and

c) the sludge is mixed with soil to a depth of 15 cm (6 in.).

Are there other "key parameters" which were not, but should have been, considered?

Related questions: Was it logical for EPA to assume that animals raised for human consumption, as well as the food and feed crops for such animals, are not exposed to D&M sludge/sludge products under the home garden scenario? Are there studies on the depth to which natural weathering/biological processes mix sludge/sludge products applied to the soil surface into the top 15 cm (6 in.) of the soil profile? (a 15 cm depth is assumed for calculating the pollutant limits). Should EPA through labels or information sheets require users to incorporate D&M sludge/sludge products into the soil to a depth of 6 to 8 in.?

Response No additional "key parameters" were identified.

a) The question and assumption regarding animals and feed crops seems reasonable provided the MEI is changed as suggested in the previous question. We agree with EPA that city ordinances would not allow the housing of farm animals, which provide food products to humans, in urban/suburban areas. However, if the currently proposed rural non-farm family MEI were retained, then the possibility of small animals such as goats and poultry, coming into contact with D&M treated soils is increased. Under a rural MEI scenario, the decision to exclude pathways 3, 4, 5 and 6 for risk assessment should be reconsidered.

b) We agree that the background concentrations of metals for soils selected by the EPA (Table 4-25, p. 4-115 of the TSD) are reasonable to use, unless a soil has been contaminated. A more acceptable citation for the Holmgren et al database (until it is published) would be Sommers et al (1987).

c) We know of two references (Lee, 1985 and Tisdal, 1978) that would support the physical mixing of organic residues (applied to the soil surface) into the underlying soil, as a result of earthworm activity. The depth of mixing was not indicated by Tisdal (1985), but Lee (1985) cited references indicating that earthworms will move organic surface litter into the soil to depths of 11 cm and 18 cm. One study cited by Lee indicated that the time for disappearance of one-half the grass litter, placed on a soil surface, was 5.7 weeks.

However, we recognize that the time required for these natural processes to mix surface applied sludge into the top 15 cm may be too long for one to assume complete dilution of sludge pollutants by mixing to this depth shortly following application. Therefore, a 50% dilution of sludge pollutant levels by thatch and other organic residue deposition may be a more realistic level of dilution to expect over the short term and could be the assumption to use in risk assessment scenario. Over the long term, we would expect additional dilution by natural mixing to a depth of 15 cm or greater.

5) Based on the premise that D&M sludge/sludge products would be used in home gardens, EPA made these assumptions:

a) the POTW could not control product use;

b) the EPA could not impose access or use restrictions;

c) the EPA could require that instructions on the proper use of the product accompany the product; and

d) users would comply with the use instructions.

Are these assumptions appropriate? Should some be deleted or others added?

Response These assumptions are generally appropriate. Parts a) and d) seem to be in conflict, because the POTW does have control to the extent that guidance can be provided through "labeling" and "performance agreement" provisions.

6) EPA believes that it would be impractical to establish case-by-case limits for D&M sewage sludge/sludge products because of the infinite number of possible site-specific conditions. Is this a logical assumption?

Response As long as D&M sludge/sludge products use is defined according to the proposed rule, this assumption seems logical. However, more important than attempting to implement one set of rules for D&M products to be used in an infinite number of different site conditions is the recognition that one set of rules will not be appropriate for the wide variety of D&M products.

Therefore, we recommend that some end uses of D&M products be limited by adopting commonly used management practices and a "clean sludge" to allow establishment of "use-specific" limits. For the sake of discussion, we drafted maximum concentrations of selected pollutants that may be permitted in a "clean" sludge (Table 2). "Use-specific" controls would restrict products to a segment of the market based on type of use (as further discussed under Issue no. 7). In addition, certain end uses may allow a sludge product to be regulated under Non-Agricultural Land Application (Non AgLa) rather than as a D&M product.

Table 2. PRC Summary of pollutant application limits pathways analyzed.

POLLUTANT	Path 1	Path 1F	Path 2F	Path 5	Path 6	Path 7	Path 8	Path 9	Path 12
	cumulative kg/ha								
Cu				>2390	3930	1160	1200		
Zn						2750		>2600	
Ni		>>500		500*					
Cr						no basis			no basis
Pb	>>1000	>1000	580**			>>1000		>1000	
Cd		18				>20		>20	
As			1628						
Mo				17					

*See text for explanation of this value.

**For Pb and analysis of Pathway 2F for D&M the PRC concludes that sludge concentration shuld be 300 ppm or less.

7) Is the use of D&M sludge/sludge products based on an applicable AWSAR to meet pollutant limits the appropriate method?

Response For some end uses of D&M products, the AWSAR is not the appropriate method to address risk assessment concerns for regulated pollutants. Examples of various D&M end uses are listed in Tables 3 and 4 and support the difficulty of using an AWSAR approach. Composted sludges, heat-dried sludges, and sand bed-dried sludges each require different application rates, depending on their benefits when applied to soils. For example, many composted sludge uses (Table 3) are as soil amendments which are typically applied at rates above 20-50 mt/ha/yr, but at less than an annual frequency. Heat-dried sludges will typically be applied at rates less than 5 mt/ha/yr.

This workgroup supports the concept of using a "clean" sludge standard, as proposed by the AgLA, as a more sensible method for regulating many D&M end uses. Further, utilizing such a concept would allow for a material meeting this "standard" to be used once every 5, 10, 20, etc. years or longer at a higher rate than is suggested by AWSAR's within the nitrogen fertilizer application rate restriction.

8) For the home garden scenario, EPA assumed an application rate of 11 metric ton/ha for aggregate health risks across the 22 pollutants (p. 5781). Is this a reasonable rate? (11 mt/ha = 5 ton/ac = 230 lb/1000 ft^2)

Table 3. Examples of D&M uses where products are used primarily as soil amendments by "professional" and "retail" markets.[a]

Users	Uses
Bulk Market - Wholesale	
Landscapec contractors	Turf establishment
Nursery trade	Soil renovation
Topsoil blenders	Horticultural
Special potting blenders	Turf renovation
	Land reclamation
	Potting soils
	Amendment reformulations
	Top dressing (low use)
	Mulching
Bagged Products	
Retail nurseries	Horticultural top dressing/mulching
Home garden	Shrubs/flower gardens
Landscape contractors	Vegetable gardens (very low)
Institutional accounts	Potting soils
Container growers	Soil renovation (small plots)
Golf courses	Outdoor planting mixes
Homeowners	Seed covers
	Seed preparation amendments
	Vegetable and garden planting mixes

[a] Composted sludges are sometimes blended or composted with other materials to produce specialty products for both types of markets. Estimates by several producers of D&M products indicate that only a small portion (probably <10%) of the quantities generated go to Bagged Products for the retail market.

Table 4. Examples of D&M uses where products are used primarily for their fertilizer value by "professional" and "retail" markets.

Users	Uses	
	Professional	Retail
Blenders, as a fertilizer component	Golf courses Parks Cemeteries	Lawns Ornamentals Trees Vegetables
Blenders, as a fertilizer bulking agent	Athletic fields School districts Municipal, State, County, and Federal Governments Departments of Transportation Industrial grounds Hospitals Roadsides Other turf & ornamental uses Agricultural Miscellaneous Uses - Melting ice on turf areas to prevent killing of grasses - Septic tank starters - Metal conditioning - Drain cleaning	

Response Because of the great difference between D&M products, it is unrealistic to consider only one rate for all these products. Since the 11 mt/ha is probably a "compromise" between heat-dried and composted sludges, this rate does not really apply to either. It would not be uncommon for a compost product to be applied at a rate of 200 mt/ha over a 20 year period, while heat-dried sludge could be applied at an annual rate of 4 mt/ha for 20 years (i.e., 80 mt/ha total). The benefits obtained from each type of product are different, the rates needed for different end uses are different, and associated risks will be different depending on that end use. Therefore, it is inappropriate to purpose only one application rate to all these conditions.

9) Is the assumption that 20 applications of D&M sludge/sludge products would be applied to land, for purposes of calculating the pollutant limits for metals, logical? Is there documentation to show that a greater or smaller number of applications are generally applied to home gardens?

Response We know of no documentation to support or dispute the use of 20 annual applications as a basis for calculating cumulative pollutant limits for metals. Whether the 20 annual applications are made consecutively in 20 years or made over a longer time period appears to be a reasonable policy decision by EPA for D&M end uses where products are applied to land at regular intervals. However, the concept of "20 annual applications" (or 20 AWSAR additions) to land is not applicable to higher, non-annual end uses of D&M products. This non-applicability is further discussed under Issue no. 7.

10) Will the apparent anomaly of less restrictive pollutant limits for D&M, compared to ag land application, create problems for those POTW's involved in the distribution and marketing of sludge?

Response With the exception of differences in the degree of pathogen destruction, the same quality sludge product can be marketed as sludge compost, potting mix, etc. for urban use or provided to farmers/growers for crop production. Therefore, there really is no anomaly.

11) Is it appropriate for EPA to assume that use of D&M sludge/sludge products can be controlled with a product label? Is it correct for EPA to assume that users of D&M sludge/sludge products will follow the instructions on the proposed label or information sheet to be provided (with the products) to end users?

Response Sewage sludge is one of the final products of the urban wastewater management scheme accomplished by the POTW. Final disposition of sludges, therefore, should not be viewed as an independent event but as an integral component of the wastewater collection and treatment system. If an effective industrial pretreatment program is in place and the treatment performance of the POTW is maintained, we would expect the quality of the sludge it produces to be "good" and suitable for land application. If the risk assessment to evaluate hazards associated with pollutants in sludge is properly performed, we can also expect the risk associated with the application of this sludge to be minimal.

Technically, then, if the sewage is not properly treated and industrial discharges controlled and/or the risk assessment is inadequate, labeling of D&M products will be a poor way of guarding against the unsafe use of these products. As there is no real technical reason to label D&M products, we consider the product labeling a policy issue, and the label should be used to provide consumer information on proper use of the product rather than provide warning on its hazardous chemical content.

We recognize the concern of one group member that too many Americans are illiterate, and these individuals are not able to follow written guidance on labels. However, labeling of application rates as inches of compost or bags of heat-dried products per 1000 ft^2 (108 m^2) of lawn or garden could be done simply and clearly with diagrams. In addition, the assumptions used by the EPA seem appropriate and consistent with expectations assumed by other federal and/or state agencies when requiring labeling for other consumer products, such as fertilizers, prescription drugs, pesticides, etc.

12) Are the provisions required by EPA for labels or information sheets to accompany D&M sludge/sludge products appropriate? Should any provisions be deleted or added to those proposed? [Federal Register, Feb. 6, 1989, p. 5883, Sec. 503.24 (b)]

Response Provisions (1), (2), and (6) are reasonable requirements.

Provision (3): Listing the nitrogen (N) and phosphate (P_2O_5) content of D&M products is important for the proper management of these nutrients relative to groundwater and surface water quality concerns. Requiring a listing of concentrations for all of the 22 selected pollutants in Table 4 of the proposed rule (Sec. 503.23, p. 5882) would cause undue confusion by potential users of D&M products. The reasons such information is unnecessary have been stated in response (11). We recommend the following statement be substituted for this part of Provision (3), as well as for Provisions (5) and (12), which could then be deleted -- "Use of this product must be done strictly in accordance with instructions. This product complies with the EPA limits on trace pollutants for sewage sludge products. For a listing of these trace pollutants and the concentrations of each in this product, write to: **(name, address and telephone number of D&M generator added).**"

Provisions (4), (7) and (8): We suggest that these provisions be combined under a statement that would address commonly accepted/recommended management practices which should be used when D&M products are applied to land surfaces. These management practices would include (a) matching nutrient additions from D&M products to the needs of the crop, especially to avoid excess N loadings and (b) utilizing good soil and water conservation practices to prevent runoff/erosion of particulates and nutrients, especially P loss to surface waters. In addition, we recommend that a mechanism be available for case-by-case considerations by states or regions where specialized uses of D&M products may require some variation from these recommended management practices.

Provision (9): Some rewording is needed to clarify that the concern with children is for ingestion.

Provision (10) and (11): The premise of using the urban MEI (as suggested above) and the fact that the common end uses of D&M products are in urban environments do not warrant that these provisions be included on labels and information sheets.

We recommend that these provisions be deleted.

13) Are the provisions required for the "performance agreement" [p. 5881, Sec. 503.22 (b)] appropriate? Are there ways to simplify this agreement? Should any provisions be deleted or added to those proposed?

Response Some modifications are needed to provide for the use of a "clean" sludge standard rather than an AWSAR for selected D&M end uses identified in Issue no. 6. Where a "clean" sludge standard is used, Provisions (3) and (4) would indicate that the sludge product has passed an EPA quality standard for pollutant composition and can be used according to labeling instructions or further diluted by mixing with non-sludge materials. However, any non-sludge materials used for blending or remixing with the sludge product cannot contain concentrations of pollutants which exceed the concentrations defined in the "Clean Sludge" standard.

14) EPA is proposing that records for D&M sludge/sludge products be retained for 5 years (some consideration of 3 years was made; for land application, records must be retained for the life of the POTW). Is 5 years appropriate? [Federal Register, Feb. 6, 1989, p. 5896, Sec. 503.83 (b)]

Response Generally the record keeping information required to be kept for 5 years is acceptable. Provisions (3) and (5) could be a deterrent for distributors, re-blenders, etc. if these record keeping requirements were passed along. Under a program that would allow a "quality sludge standard" to be used for some D&M end uses, as recommended in preceding questions, record keeping requirements would not be necessary for distributors, re-blenders, etc.

ADDITIONAL D&M ISSUES OF CONCERN

1) The rate-limiting concentrations of many pollutants in the proposed regulation, especially the organics, are below the limit of detection of present analytical methods.

Comments In our opinion, this is a very serious flaw of the proposed regulations. The technical deficiencies of this issue are reviewed in the AgLA and NonAgLA sections, so it will not be repeated here. The implications of this requirement to POTWs and their D&M contractors, however, are far-reaching. Since compliance with the regulation is dependent upon accurate chemical analysis, it is essential that the limiting concentration set by the regulations are technically achievable by routine analytical methods used by certified laboratories. Otherwise, they will be required to perform costly chemical analyses to generate compliance data which is meaningless.

Assuming that the concentration of a pollutant in a sludge/sludge product is equal to the detection limit, when that pollutant concentration is somewhere between zero and the level of detection, is not a good regulatory approach. It is unreasonable that the limiting concentration of pollutants are set at concentrations below the limits of detection. More detailed comments about the use of (a) detection limits for organics or (b) concentrations of organics below analytical detection limits in the proposed rule can be found in other workgroup reports.

2) Use of unreasonable MEI's for exposure assessment.

Comments In addition to the MEI scenario for D&M being a rural non-farm family growing 60% of their fruits and vegetables in sludge-amended home garden, several other assumptions on MEIs of other D&M pathways are equally unreasonable. For example, is it reasonable to make the assumption that someone will drink 2 liters of water per day for 70 years from streams as the MEI of pathway 11 is defined? It is not reasonable to expect that residents of urban areas, where D&M products are primarily used, would consume this quantity of water directly from streams and rivers flowing through or near urban areas and are contaminated by runoff from sludge-amended areas. Nor would one expect the consumption of 6.5 g per day (again for 70 years) of fish taken from these contaminated waters.

Human dietary habits, as well as food consumption, change with genders and ages. It is unreasonable to assume that the MEI's consumption of food from each food category equals the highest estimated consumption of the food category. Realistically, no one is able to sustain this type of dietary habit for a 70-year life span.

Since the unrealistic MEI leads to severe restrictions on pollutant loading limits, we urge EPA to reconsider developing reasonable and realistic exposure scenario for the risk assessment.

3) Relative effectiveness (RE) of Dose should not equal 1.

Comments EPA has assumed that the relative effectiveness of the dose to humans equals 1. Sufficient data is present in the literature to demonstrate that sludge-borne pollutants and plant absorbed pollutants are far less biologically available to humans and to other animals than reagent-grade chemicals commonly fed to laboratory test animals during toxicity assays. In the section reviewing the AgLA, pollutant by pollutant and pathway by pathway discussion along with relevant reference sources are presented. The same issue is further articulated by the section reviewing risk assessment methodology.

Proper validation of model parameters, such as RE, is essential for a creditable risk assessment. The assumption that RE=1 overestimates hazards of the pollutant and lower the permissible pollutant loading. EPA should adopt realistic RE for the exposure and risk computations.

4) Lead exposures through the D&M home garden scenario.

Comments For this exposure it is necessary to consider the true pica child who has a very low probability of occurrence as being the MEI. Further, in light of the potential for direct ingestion of undiluted sludge products (including compost) from the soil surface or from the bag or piles awaiting utilization at private homes, his/her exposure must be considered to be direct. This direct exposure is discussed in the AgLA section, and we agree with the analysis and conclusion that a limit of 300 mg Pb/kg limit should be acceptable for unrestricted use.

5) Selection of data in computing plant uptake slope.

Comments In the past several years, data from field experiments have become readily available. While in many incidences field experiments demonstrated no significant adverse effects on yield and no accumulation of pollutant in plant tissue, EPA elected to by-pass these data and adopted data from pot experiments in which soils were treated with "pure chemicals" or "pure chemical"-spiked sludges. Notably, data in MacLean and Decker (1978) were repeatedly used; this is an example of inappropriate data selection. As the pathways considered in D&M were identical to those considered in AgLA , we referred the readers to that section for additional details.

6) Use of sensitivity analysis in exposure and risk assessment.

Comments Section Five of the Technical Support Document detailed results of "sensitivity analysis". As the results in this section were not referenced elsewhere and the term sensitivity analysis was not defined, we were uncertain as to the purpose of this section. Barbara Corcoran (of EPA) indicated to us during one of our sessions that this section had been prepared for a three-tiered rule option which EPA did not choose to use. However, we would support this type of exercise, where sensitivity analysis refers to "a process of testing which data and assumptions inputted into the risk assessment model have the greatest effect on the most limiting pollutant loading determined by the various pathways". Conducting a sensitivity analysis would allow one to identify those data and assumptions which are the most critical to the end result obtained for each pathway. These data and assumptions should then be selected with the utmost care so as not to generate unrealistic values in an effort to accomplish a rational risk assessment.

7) The definition for D&M in the proposed rules is not adequate to reflect actual D&M end uses.

Comments D&M encompasses a divergence of uses of sludge and sludge products. This is an area where technical ingenuity and entrepreneurism in sludge management can be expected to flourish. Under the current practices, sludge products contain typically 5-75% sludges and are marketed as fertilizers, soil conditioners, potting mixes, etc. (Table 1). According to the proposed rule, all products containing sludge are sludges and must comply with land application rule.

We have no argument with calling products whose primary ingredient is sludge or whose primary use is soil conditioning as "sludge". What happens to these materials in soils will not be different from the sludge in other land application settings. But we have serious reservations of labeling a product which contains small percentage of sludge as a "sludge". Under this situation, the sludges are often used as a carrier of plant nutrients or a medium to control nutrient release. As a result, their application rates are typically 50-300 kg/ha instead of 1-50 mt/ha. The amount of sludge received by land, even with repeated applications over a long period of time, would be small and the risk this type of practice poses is insignificant. It is inappropriate to call such types of products "sludge". The regulation is better served to focus its implementation and enforcement efforts elsewhere and allow the entrepreneur to creatively distribute and market the sludge products provided the sludge used meets a minimum quality standard.

8) D&M uses can not all be lumped into one category.

Comments A provision is needed within the proposed rule to allow D&M product generators to continue some end uses which do not fit under the assumed "20 annual application" garden conversion scenario for D&M treated areas. End uses to be allowed for high rate or one-time batch applications include:

a) turf establishment -- the D&M product would be incorporated into the top 6 inches prior to establishing a vegetative cover; examples could be home lawns, parks, cemeteries, roadsides and medians, landfill closures, etc.

b) landscaping/nursery -- the D&M product would be mixed with soils in preparation of installing or growing landscaping plant species such as shrubbery, floriculture/ground cover, trees, etc.

c) potting mixes -- D&M products would be used as components of potting soils or media and container mixes for landscaping or growing nursery stock.

The concept of an AWSAR is not applicable to several of the end uses identified in Tables 2 and 3. Also, the likelihood of conversion to a garden area, which might be used to grow fruits and vegetables for human consumption, would be very small. We propose that two approaches which allow for higher non-annual application rates or one-time "batch" uses of D&M products:

a) one or more applications that would add an equivalent loading of a pollutant as allowed by 20 AWSAR applications, or

b) unrestricted use if a D&M product meets a "clean" sludge standard.

Under a), metal loadings to the soil would be the same. For organics, one large loading would not allow for the annual decomposition currently allowed for in the various pathways. However, within 2-3 years, a majority of most organics are decomposed or effectively bound to soil organic matter. Therefore, a restriction against conversion to a vegetable garden for 3 years or longer could be a labeling requirement as a condition when using a high application rate. (This type of restriction is similar to that used for Class B pathogen requirements on AgLA restricting food crops from being grown for a least 18 months after sludge application.) Under b), little if any restriction on use of D&M products would be needed if it met a "clean sludge" standard. As a first attempt, Table 2 lists maximum pollutant concentrations allowed in the D&M product in order to qualify for unrestricted use.

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Mr. **Odeal**. Additionally, the Federal Government must continue to exercise its leadership in developing clear and concise objectives that all of us can embrace and pursue at each level of government—objectives that address the real problems of pollution. To this end, Congress and the Administration must be actively involved in building national consensus on these issues. It is important that your efforts foster a climate of support for programs, investments, and intergovernmental cooperation needed to improve and protect our nation's waters—support that recognizes the partnership of the federal, state and local governments necessary to address these complex issues.

A position contrary to this philosophy is reflected in the Bureau of Land Management's January 3, 1990 policy prohibiting the application of sewage sludge on public lands, even for beneficial purposes. This short-sighted and simplistic approach preempts EPA's ongoing regulatory process and runs contrary to their long-standing effort to promote local sludge recycling initiatives. Our members and other POTWs throughout the country receive an extremely conflicting message when the EPA encourages the beneficial use of sewage sludge and another arm of the Federal Government says "Yes, but not in my back yard." It is this attitude that has plagued environmental cleanup efforts throughout the country over the years.

In our view, this policy should be reconsidered and revised immediately. We solicit your assistance in this regard to ensure that BLM policy is consistent with EPA's stated goals and objectives.

Mr. Chairman, I would like to submit for the record a copy of the policy and our letter to Administrator Reilly requesting that EPA actively pursue getting this policy overturned.

[The Bureau of Land Management policy statement and Erwin Odeal's letter to William Reilly follow:]

ASSOCIATION OF METROPOLITAN SEWERAGE AGENCIES
1000 CONNECTICUT AVENUE, N.W. SUITE [illegible] WASHINGTON, DC 20036
(202) 833-AMSA FAX (202) 833-4657

MEMBER AGENCIES
Jefferson County Sewerage District, AL
Anchorage Water & Sewer Utilities, AK
City of Phoenix, AZ
Pima County Wastewater Management, AZ
City of Little Rock, AR
City of Pine Bluff Sewer System, AR
Chino Basin Municipal Water District, CA
Orange County Sanitation District, CA
City of Los Angeles, CA
Central Contra Costa Sanitary District, CA
East Bay Municipal Utility District, CA
Sacramento Department of Public Works, CA
City of San Diego, CA
City of San Francisco, CA
City of San Jose, CA
Ventura Regional Sanitation District, CA
Los Angeles County Sanitation District, CA
City of Colorado Springs, CO
Metro Denver Sewage Disposal District, CO
The Metropolitan District Hartford, CT
Sewer Authority of the City of Norwich, CT
District of Columbia, DC
City of Jacksonville, FL
Orange County Public Utilities, FL
The City of Orlando, FL
Escambia County Utilities Authority, FL
City of Tampa, FL
City of Atlanta, GA
City of Honolulu, HI
City of Boise, ID
MSD of Greater Chicago, IL
North Shore Sanitary District, IL
Sanitary District of Rockford, IL
The City of Indianapolis, IN
Johnson County Unified Wastewater
Districts, KS
City of Wichita, KS
Louisville & Jefferson County MSD, KY
New Orleans Sewerage & Water Board, LA
City of Baltimore, MD
Anne Arundel County, MD
WSSC, Hyattsville, MD
MWRA, Boston, MA
Upper Blackstone WPAD, MA
South Essex Sewerage District, MA
County of Wayne Public Works, MI
Detroit Water & Sewerage Department, MI
City of Grand Rapids, MI
City of Kalamazoo, MI
WLSSD, Duluth, MN
Metro Waste Control Comm., St. Paul, MN
City of Kansas City, MO
St. Louis MSD, MO
City of Omaha, NE
Reno-Sparks Wastewater Treatment
Facility, NV
Ocean County Utilities Authority, NJ
Essex and Union Counties, NJ
Bergen County Utilities Authority, NJ
Passaic Valley Sewerage Commissioners, NJ
Rahway Valley Sewerage Authority, NJ
Middlesex County Utilities Authority, NJ
City of Albuquerque, NM
City of Las Cruces, NM
Albany County Sewer District, NY
Buffalo Sewer Authority, NY
Nassau County D.P.W., NY
City of New York, NY
County of Monroe, NY
Onondaga County, NY
Raleigh Public Utilities Department, NC
City of Akron, OH
Greater Cincinnati MSD, OH
NORSD, Cleveland, OH
City of Columbus, OH
City of Dayton, OH
City of Toledo, OH
Tulsa Water & Sewer Department, OK
Unified Sewerage Agency, OR
City of Portland, OR
City of Philadelphia, PA
Allegheny County Sanitary Authority, PA
Narragansett Bay Commission, RI
City of Chattanooga, TN
City of Knoxville, TN
City of Memphis, TN
City of Nashville, TN
Trinity River Authority, TX
City of Dallas, TX
El Paso Water Utilities, TX
City of Fort Worth, TX
Gulf Coast Waste Disposal Authority, TX
City of Houston, TX
City of San Antonio, TX
Salt Lake City Public Utilities, UT
Central Valley WRF, UT
Fairfax County Sewer System, VA
Hampton Roads Sanitation District, VA
Municipality of Metropolitan Seattle, WA
City of Tacoma, WA
Green Bay MSD, WI
Madison MSD, WI
Milwaukee MSD, WI

March 20, 1990

Mr. William Reilly
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Dear Administrator Reilly:

I would like to bring to your attention a policy on the disposal of municipal sewage sludge on public lands that was recently adopted by the U.S. Department of Interior, Bureau of Land Management.

This policy, a copy of which is attached for your review, states: "Based on the risks and problems associated with sewage sludge...the BLM policy shall be to prohibit the disposal of sludge on public lands" (emphasis added). The policy goes further to assert "At this time, the BLM cannot support land application of sewage sludge on public lands, even for beneficial purposes that would result in a non-consumptive use" (emphasis added).

The Association of Metropolitan Sewerage Agencies vehemently opposes this policy, and we request that you intercede with the Bureau of Land Management to seek a revision of this policy so that it is consistent with the stated goals and objectives for sewage sludge management as proposed by the Environmental Protection Agency in the proposed sewage sludge regulations.

The BLM policy is untimely, and preempts the EPA's regulatory efforts governing sludge use and disposal. Your Agency has invested substantial time and resources into the development of sewage sludge regulations that would identify the parameters and management practices necessary to ensure public health and environmental safety. The regulations, proposed only last year, have also undergone widespread peer review and public comment, and your staff is now in the process of considering these comments and revising the regulations to improve their technical accuracy. The BLM policy is based upon conclusions that are wholly unsubstantiated in the voluminous record of the sludge rulemaking, and in fact are directly opposed to the EPA 's assessment that there is not a major health risk from the land application of sewage sludge, even today in the absence of the final technical regulations.

The EPA has clearly and consistently stated that it supports, and even encourages, the beneficial reuse of sewage sludge. This position is consistent with the Agency's overall policy of recycling and pollution prevention, and represents a sound environmental approach to the use of a necessary by-product of water pollution control. There are many instances of successful applications of sewage sludge to agricultural lands, and also for the purposes of mining area reclamation, forest enhancement, construction site rehabilitation, and landscaping beautification. The BLM policy specifically prohibits the use of sewage sludge for these purposes, and will have the effect of severely restricting beneficial reuse options and increasing the use of disposal techniques such as landfilling and incineration. The policy will also inhibit beneficial reuse on state and private lands due to adverse (although unfounded) perceptions about the risks of such use. AMSA supports the beneficial reuse of sludge where possible, and we strongly urge you to seek a reversal of the ill-conceived BLM policy.

I will be raising this issue in the upcoming Congressional hearings on the Clean Water Act, and AMSA will oppose the BLM policy and work for its recision. In this regard, I am certain that we share mutual interests in assuring that the reuse and disposal options for sewage sludge are directed by sound technical regulations, and I would be happy to meet with you to coordinate our efforts to accomplish this objective.

Sincerely,

Erwin J. Odeal
President

ENCLOSURE

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

IN REPLY REFER TO:
1703/2740 (321/707)

JAN 3 - 1990

Instruction Memorandum No. 90-228
Expires: 9/30/90

To: AFO's

From: Director

Subject: Disposal of Municipal Sewage Sludge on Public Lands

Recent field inquiry requested that the Washington Office (WO) develop a definitive policy on whether the Bureau of Land Management (BLM) should allow disposal of treated municipal sewage sludge on public lands. We met with representatives of the Environmental Protection Agency to discuss the sewage sludge disposal question. Based on the risks and problems associated with sewage sludge and the nature of the lands and types of activities conducted under BLM management, the BLM policy shall be to prohibit the disposal of sludge on public lands.

Consumptive use of agricultural products grown with sludge fertilizers, which contain contaminants such as toxic, heavy metals (e.g., lead, zinc, cadmium, and chromium), constitutes a significant risk to public health and the environment. These toxic elements are absorbed by plants; the plants are ingested by cattle and sheep and then passed on to humans who consume the meat and milk. There are also potential risks to any grazing or browsing wildlife ingesting metal contaminated plant material. This could affect the health or reproductive capacities of livestock, big game animals, and endangered species inhabiting public lands.

At this time, the BLM cannot support land application of sewage sludge on public lands, even for beneficial purposes that would result in a non-consumptive use. For example, use of sludge as a fertilizer and soil conditioner has been recommended for forest enhancement and restoration, mining area reclamation, construction site rehabilitation, park beautification (flower gardens), etc., as beneficial, non-consumptive uses. However, these types of activities on public lands are of low intensity and, by their nature, would constitute single time applications. As such, they would not be suitable avenues of disposal of sludge for cities seeking sites for continuous or large volume disposals. Use of sludge, even for these purposes, may provide a source of contaminants that can infiltrate both surface and ground water. This could taint drinking water for livestock, wildlife, fish, and human use. Further, there is concern that sludge sprayed on arid and alkaline western soils could, when dry, be blown by winds, thus becoming an additional source of contamination.

Finally, Federal taxpayer liability for cleanup and damages caused by the disposal of sludge on public lands is also a major concern. In addition to liability risks under the Comprehensive Environmental Response, Compensation and Liability Act or the Clean Water Act, there is also the risk of damages to natural resources and investments on public lands, contrary to the BLM's statutory mission.

As identified previously, the most beneficial use of sludge currently is in the commercial production of non-consumptive commodities such as trees, sod, and flowers. In instances where communities, are in need of disposal sites and other suitable locations are not available, the BLM may still provide sites through the Federal Land Policy and Management Act sale process. Once the rule is promulgated, conveyance (sale and patent) of public land for such sites may also be made under the Recreation and Public Purposes Amendment Act of 1988.

Questions may be directed at Gary Rowe, WO-321, on FTS 343-8693 or Ryan Dudley, WO-707, on FTS 343-5517.

/s/ Dean E Stepanek
Deputy

cc: LLM:MIB:707:Rm. 3529
LLM:Prmr:222:Rm. 909
LLM:MIB:320 rf, 320 hold
LLM:MIB:321:Rm. 3643:GRowe:lb:12/13/89:343-8693 0435r

Mr. ODEAL. If the Federal Government continues to withdraw from the financing arena, AMSA encourages the Congress to carefully consider the overall impacts resulting from any new requirements. Since local governments are increasingly expected to contribute a higher proportion of funding for these programs and initiatives, local taxpayers must have a better appreciation of how these Federal directives will translate into real environmental improvements. Water quality problems are site-specific and local flexibility—for both problem identification and solution—will be critical for local funding support. Priorities should be established through a comprehensive process that allows regulators and local entities to work together.

Legislation and regulations aimed at controlling pollutants, constituent by constituent, do not ensure environmental improvement and prevent the balancing needed to direct resources at the causes of water quality impairment. The whole issue of how to meet future environmental mandates requires study to determine if the approaches used in the 1970s and 1980s will work for the problems of the 1990s. Cross media impacts, balancing waste allocation and local environmental strategies will emerge as effective tools for the future as "end of the pipe" regulations prove themselves to be outdated.

In the coming months, AMSA plans to dedicate considerable effort to developing approaches for dealing with the bigger environmental picture of which it is a part. By utilizing the knowledge and expertise of our members, we plan to develop a specific legislative proposal that builds upon the accomplishments already achieved under the Clean Water Act and allows us to move forward in an environmentally sound and results-oriented manner to make additional significant water quality improvements in the future. We would like very much to work with you and your staff as we develop this proposal over the next several months.

And now, I would like to say a few words about enforcement. As I noted earlier, we are treaters, not polluters. We are partners with the Federal and state governments in helping clean our nation's waters. We would like to be treated as partners with you in this process. We acknowledge that enforcement actions may be appropriate in some instances, but we cannot support the current system where penalties and fines are placed in the Federal Treasury—and not utilized to protect or clean up the environment on whose behalf they were assessed.

Therefore, I encourage you today to give serious consideration to an alternative approach that would provide that monies collected through environmental enforcement actions be utilized directly for continued protection of the environment. Additionally, I encourage you to be sensitive to the fact that enforcement actions against local agencies that are proceeding in good faith with environmental cleanup efforts are counterproductive and run the risk of eroding public confidence in all our efforts to protect the environment. This is particularly true as permit violations are applied to indicators that are still in the scientific development stage.

AMSA members have made great strides in protecting the environment through industrial pretreatment and appropriate treatment of our nation's wastewater. Continuing efforts are well underway. At this point in time, it is important to look at all issues affecting our environment from an integrated point of view. POTWs are not only involved in municipal wastewater treatment issues, we are involved in clean air issues, Superfund issues, stormwater management, the control of non-point sources of pollution, solid waste and a myriad of other areas. Again let me emphasize that we are a partner with both the Federal and state governments in working toward a mutual goal, the protection of our national environment.

Now I will turn the microphone over to Ed Wagner to complete AMSA's remarks.

[The prepared statement of Mr. Erwin J. Odeal appears on page 315.]

TESTIMONY OF EDWARD O. WAGNER, ASSISTANT COMMISSIONER, NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Mr. WAGNER. Mr. Chairman, I too am pleased to be here this afternoon to meet with you and present as part of this panel this statement.

As Erwin noted, I am the Assistant Commissioner of the Department of Environmental Protection and the Director of the Bureau of Wastewater Treatment in New York City, and also a member of AMSA. What I plan to do is address in my remarks, to focus on a number of specific issues that are addressed within the context of the Clean Water Act.

First, with regard to the management of sludge, AMSA fully supports Congressional and EPA efforts to develop a comprehensive set of sludge management regulations and encourages the Agency to regulate municipal sludge as specified under the Clean Water Act. We believe, however, that the sludge regulations, as originally drafted and proposed, provide a clear example of what happens when a complex scientific issue is developed without intensive peer review throughout the process. This is compounded by EPA's lack of resources to fill in the science and data gaps.

As the major organization supporting the peer review effort on the sludge regulations, AMSA worked closely with the Environmental Protection Agency as the review of the regulations proceeded. We expect that the recommendations of the Peer Review Committee will be considered carefully by EPA as they develop a final rule. AMSA does believe that EPA is taking the recommendations of the Peer Review Committee seriously, revising the regulations as it sees appropriate, with the intent of developing a final rule that is both scientifically and technically sound.

Our point here is that peer review, after the regulations are drafted and out for comment, is costly. We estimate approximately $10 million were spent developing 50,000 pages of comments. This procedure also wastes time.

AMSA supports the beneficial use of sludge wherever technically and economically feasible. However, AMSA believes that other environmentally sound and site-specific management options also exist and should not be foreclosed. The evidence is that, for the most part, all of the present sludge management options used nationwide pose no significant human health or environmental risk. Our objective should be to ensure that that continues to be true in the future.

In New York City, for example, we have begun to invest tremendous sums of money in land-based alternatives for sludge management. We are working closely with the private sector to find both interim and permanent land-based sludge management alternatives that make beneficial use of sludge's organic qualities. That goal is going to be difficult to obtain, and we will need the help of those who so fervently argued that sludge should be taken out of the ocean. Fair consideration of all environmentally sound alternatives should be permitted to give localities needed flexibility to fashion appropriate sludge management programs.

The second issue I want to focus on are Combined Sewer Overflows, which have been spoken about at length here before. AMSA recognizes the problems presented by CSOs. We believe that technology exists to successfully minimize and control these discharges in such a way as to protect water quality and ensure environmental integrity. CSOs are an environmental issue in many communities, not only along our coast, but inland as well, with very serious funding consequences tied directly to how Congress and EPA address the problem.

CSOs are not susceptible to a technological standards due to the highly site-specific nature of the problem and receiving environment. Therefore, local flexibility to meet Federal directives will be critical to this issue.

While AMSA supports the EPA's overall CSO strategy, it is our view that sufficient resources do not exist at the Federal, state or local level for its implementation. We are currently reviewing EPA's guidance for permit writers and our initial analysis indicates that additional resources, time and effort should be spent to ensure that the guidance document reflects the intent of the strategy. Additionally, we are concerned that many of the initial state strategies submitted to EPA may, in EPA's assessment, require substantial revision before the program can move forward.

We therefore encourage you, as your oversight process, to take a closer look at this implementation process and the environmental gains you desire. As you do so, please keep in mind two important points. First, that local agencies have been addressing CSO problems for some time now, and second, that local conditions can have a large impact on just how those problems need to be addressed.

Federally-mandated "end of the pipe" strategies can be counterproductive. Every effort should be made to ensure, as EPA's permitting process is initiated, that permit writers consider these local conditions and have the flexibility to take into account the plans that have already been developed and implemented at the local level to address CSOs. We are also concerned that, focusing solely on CSOs without regard to urban and agricultural runoff, and other relevant issues, does not reflect an integrated approach to addressing all aspects of urban water pollution management and control.

Combined sewer overflows are a wet weather phenomenon that occurs intermittently. The quality of the discharges may vary considerably from storm event to storm event. AMSA urges Congress to recognize that approaches developed for year-round, continuous and generally invariable discharges—secondary treatment, for example, are not applicable to wet weather discharges like CSOs. Significant efforts must be expended in this area to develop approaches for dealing with these discharges, and we recommend that your Subcommittee give this consideration during the reauthorization process.

My third issue concerns stormwater management. AMSA recognizes and supports the need to address the management of stormwater. Toward this end, AMSA encourages Congress and the U.S. EPA to recognize that here too, an effective program toward controlling this widespread and complex issue should be predicated upon providing the flexibility to use local solutions for local water quality problems. Additionally, we encourage the subcommittee to acknowledge the need to manage not just urban storm runoff, but also agricultural and riverine impacts, as both relate directly to water quality.

AMSA believes that state and local governments should be given broad flexibility in developing guidelines and abatement programs aimed at controlling pollutants in stormwater. We urge Congress to assist in this area by expanding its efforts to ban and limit the use of materials, chemical and activities by individuals and companies which contribute to water quality problems.

AMSA encourages Congress to place special oversight on the EPA's regulatory efforts with regard to stormwater, specifically by reviewing Congressional intent relative to the 1987 Clean Water Act amendments addressing stormwater.

With regard to toxics, AMSA supports the concept of preventing the discharge of materials in concentrations that have been demonstrated to be toxic to aquatic or human life, and has offered both its time and expertise in working with EPA in sponsoring workshops on toxics control. However, AMSA believes that EPA's interpretation of the Clean Water Act requirements pertaining to whole effluent toxicity limits, that is applying a pass/fail approach to toxicity assessment, has created and will continue to create a major impediment to the control of toxics. The current EPA approach to whole effluent toxicity control is incorrectly focused on producing fishable, swimmable effluent, instead of protecting beneficial uses of receiving waters.

We support the use of whole effluent toxicity tests as useful scientific tools in the detection and monitoring of toxics in the nation's waters. Implementation of these tests should recognize their technical capabilities and limits, and should appropriate link permit requirements to use designation and water quality standards. Further, AMSA believes that a water quality-based toxics control program should integrate toxicity tests in a manner that is not inconsistent with chemical specific permit requirements.

Effluent toxicity tests may be appropriate as reporting requirements in permit provisions. However, tests should not be used to monitor compliance with toxicity limits until their precision and procedural uncertainties have been quantified at a level equivalent to analytical chemistry protocols. This is a toll that is still under development, and something that should only be used in combination with specific constituent limits until refinements are made.

We support a reasoned approach to toxics control in which POTW dischargers are able to detect, confirm and resolve toxicity problems without being in violation of their permits. Applying EPA's pass/fail approach to toxic control will impede efforts to protect water quality.

AMSA believes that toxicity enforcement should only be initiated with a consistent pattern of unacceptable toxicity has been demonstrated, and the discharger has failed to control this toxicity in a reasonable and timely manner.

Lastly, on the subject of toxics, all of us must recognize that toxics come from a wide array of sources, including residential, commercial and even natural sources. Efforts to control or ban products and practices detrimental to the environment could help improve water quality considerably.

Finally, with regard to funding, AMSA is extremely concerned about the financial resources necessary to meet existing and future environmental mandates required by the Clean Water Act. We believe that is absolutely essential that the Environmental Protection Agency be provided with sufficient resources, in both funding and personnel, to carry out its role with regard to these mandates in a sound, efficient and technically correct manner. If large-scale federal funding of wastewater treatment construction continues to decline, future solutions must lend themselves to more local flexibility, best management practices and local management approaches. It is imperative that good science help in our decisionmaking process.

We support full funding for the State Revolving Loan Fund through 1994 and encourage fine-tuning of the Clean Water Act to streamline the state revolving loan fund process so that it may be more effectively used to finance needed projects. We believe that the program's effectiveness has been stymied because of the widespread application of grant administration procedures to this loan program. Additionally, we note that many states are not acting on leverage options, thus limiting their ability to maximize the program's effectiveness.

We believe that Congress must acknowledge that clean water needs nationwide go beyond the State Revolving Loan Fund's ability to address. As a result, increasing pressure will be placed on Congress to revisit the issue of what role Federal support must take to assist communities in meeting the ambitious goals of the Act.

It is obvious that AMSA's concerns are substantial, but just as substantial is our desire to work with you to effectively resolve the environmental challenges that we together must face.

Again, Mr. Chairman, many thanks for this opportunity to speak with you and the members of your Subcommittee. Now, Erwin, Ken and I are available to answer any questions you may have.

[The prepared statement of Mr. Edward O. Wagner appears on page 315.]

Mr. Nowak. Thank you very much for your testimony. I think we will hear the testimony of Mr. Miller, then take all four as a panel.

Mr. Miller.

STATEMENT OF RAYMOND C. MILLER, MANAGER, SOUTH COAST WATER DISTRICT, LAGUNA BEACH, CA

Mr. MILLER. Thank you Mr. Chairman, and members of the Subcommittee.

My name is Raymond Miller and I am the General Manager of the South Coast Water District and the current President of the California Association of Sanitation Agencies.

CASA is an association of 89 wastewater treatment agencies within the State of California. Our members collectively serve more than 12 million people and the related industrial and commercial facilities throughout California. Since 1956, CASA has worked to promote sound public policy related to the implementation of water pollution programs mandated at the Federal, local and state levels.

On behalf of CASA, thank you for allowing us to present our views on the need for reauthorization of Section 205 of the Clean Water Act, the state revolving loan fund allocation formula.

In addition to this key matter, CASA also wishes to briefly discuss three other issues. First, appropriating $2.4 billion for State Revolving Loan Funds. Congress is reviewing the President's fiscal year 1991 budget request. As part of this, decisions on the state revolving loan fund program will be important to the ultimate success of the new program.

Second, issuing regulations in response to legislative mandates. An improved process to ensure good peer input early on in the development of regulations is necessary. EPA promulgation of sludge standards is an example of what occurs when peer input and review is limited during development of a very complex rule.

Third, improving water quality policy. The development of water quality standards and the need to focus on toxic constituent levels without balancing environmental gain is an issue that will create future conflicts over priorities.

In 1987, Congress passed the Water Quality Act of 1987. A pivotal point in water pollution policy, it required a transition from wastewater treatment grants to loans. As part of this transition, a phase-in was developed marking fiscal year 1991 as the time when all funding for grants would end and the funding of loans would occur.

Since its enactment, CASA has worked with the State of California and EPA to ensure a successful state revolving loan fund program. California has a program in place that minimizes regulatory red tape, promotes timely construction of wastewater treatment projects, and allocates its fiscal year 1989 and 1990 funding.

The California program was developed on the premise that Congress would fund the program at the authorized level of $2.4 billion. Under the existing formula, contained in title II, California is designated to receive 7.2333 percent of appropriated amounts. In the past few years, this has averaged approximately $142 million. If deficit reduction efforts and set-aside project funding had not affected this program, California would have received $174 million each year.

When we consider the two-for-one benefits of the loan program, this means a loss of almost $60 million per year in the ability to construct wastewater treatment projects within the state. Despite these limitations, CASA has worked toward compliance with the Federal Clean Water Act.

CASA is deeply concerned that there is temptation on the part of some to discontinue the Federal, state and local partnership. Lest there be any misunderstanding, CASA believes clean water is a policy objective that requires the partnership of all levels of government. Clean water is no less important than global warming initiatives, transportation infrastructure or financial industry bailouts.

We hope the rush to develop new and creative ways to respond to pressing domestic policy matters does not manifest itself in reductions in programs such as the newly established state revolving loan fund program. Keeping in mind that CASA has supported this program since the first debate over how to ensure long-term commitment to restore the nation's waters, we urge you today to recognize the planning and financial commitments that have taken place at the local and state levels based on the projected share of federal funds to ensure compliance with the Clean Water mandate.

We also urge you to maintain the existing section 205 formula for the next fiscal year to preserve the delicate balance of financing arrangements that will support state loan fund solvency, and review the allocation formula using the results of the decennial census along with other relevant data in 1991 to ensure that the needs of high growth rate states, either from in-state growth or interstate migration, are adequately reflected during final stages of the loan program's first full term of operation.

The allocation formula is Congress' commitment to provide resources to support the revolving loan fund program.

Once again, CASA comes before this Subcommittee to urge support of a full state revolving loan fund appropriation—$2.4 billion. We make this request fully aware of the subcommittee's unwavering past commitment to the program. Mr. Chairman, you and your colleagues have managed to communicate the importance of this program to the Budget and Appropriations Committees. For this we are grateful.

EPA estimates that California requires more than $5.0 billion to meet existing Federally eligible construction needs during this decade. This does not take into account activities considered ineligible for Federal assistance. Last year, California implemented the state revolving loan fund. This fund should ensure a self-sustaining source of revenue to meet future clean water needs in addition to the statutory requirements of the Clean Water Act. At the existing appropriation levels, California could realize approximately $700 million in Federal assistance to meet the $5.0 billion in needs.

CASA, working with state clean water authorities, began work to implement this program with the hope that promises for the full funding of $2.4 billion would be met. Unfortunately, this has not been the case with actual appropriations. While having exceeded Administration requests, appropriations have fallen several million dollars below the authorized level. Last year, Congress made significant inroads to correct this situation. You increased funding over the previous year, despite the pressure of Gramm-Rudman.

As fiscal year 1991 appropriations decisions begin to be made, CASA urges you to support a $2.4 billion appropriation. This year full funding is critical. Fiscal year 1991 marks the first year in which all available funds must be used for state revolving loan fund. California made the decision in 1989 to put all the Federal grants received into the state revolving loan fund. Any decrease in appropriate amounts could jeopardize the fiscal stability of California's loan program. Disruption of planned projects and on-going projects would result.

With the 20th anniversary of Earth Day just one month away, we urge you, Mr. Chairman, and the other members of the committee, to reject the administration's request of $1.2 billion and again support a full appropriation. This is one important way for Congress to demonstrate its commitment to the environment.

The Water Quality Act of 1987 mandated EPA to issue standards for the disposal of sewage sludge. As we are all aware, the proposed regulations were issued shortly before a court deadline for hearing an environmental interest group's suit urging immediate promulgation of the rule.

When EPA published the proposed regulation, CASA carefully reviewed the proposal. We found the rule overly long and cumbersome, more than 3,000 pages in length. We found the rule was based on inappropriate assumptions. The rule was founded on incomplete or incorrect data. Furthermore, after several years of EPA research, analysis and policy development, a rule was proposed that served to harm the recycling markets because of questions about the safety of composed materials. In January of this year, the Bureau of Land Management issued a statement that it will no longer allow the use of composed materials from sewage sludge on nonproductive lands.

CASA and its members have spent thousands of dollars and incalculable hours of staff time to review the sludge technical standards. Unfortunately, we concluded the regulation was scientifically flawed. This was not a unique conclusion. CASA found its position in line with the EPA Science Advisory Board and the Peer Review Group which determine if proposed rules are scientifically supportable.

More than $15 million was spent nationally by local entities to prepare 50,000 pages of comments on the rule. A process which takes years to generate regulations only to require larger investments to point out areas of improvement needs to be changed.

The clean water issues of the 1990s and beyond are highly technical. CASA highlights this fact because we and the communities we serve believe the regulatory rulemaking process needs to be revised to enable peer input early on in the process. When risk assessment models and levels of risk are decided upon, peer review should then take place. Often this can be in the beginning of the development of a regulation.

The proposed sludge regulation is a case study on what happens when technical advice to support EPA on complex policy matters is limited or is relied upon after the fact. The present use and timing of peer review is an inefficient and ineffective way to support regulation development.

A new mechanism that involves the selection of intelligent, technically qualified experts, through organizations like the National Academy of Science, or other similar groups, must be available to provide uncompromised input. This is not a novel idea. In other arenas of the federal rulemaking process, technical, industry and consumer representatives sit with an agency to consider planned policies and recommend actions. The key would be to establish a group outside of EPA which can utilize a credible procedure for convening peer groups for different assignments as needed by the Agency. Peer review and the use of risk assessment decisions after the regulations are drafted and published for comment is costly and a waste of time.

CASA believes these recommendations offer an effective way to ensure technically defensible rules are proposed and to avoid future rulemaking delays.

One of the most important actions initiated since enactment of the Water Quality Act is implementation of Sections 304(l) and 303(c)(2)(B). Section 304(l) ensures that any segment of a body of water that would not achieve water quality standards would have an individual control strategy to bring it into compliance, and section 302(c)(2)(B) requires the adoption of standards for individual constituents.

Unfortunately, current implementation trends of section 303(c)(2)(B) through sections 304(l) of the Clean Water Act emphasize constituent-by-constituent toxic levels without considering how to effect environmental gains. This process will require the identification of sources of the constituent causing the problems and working out problems. POTWs may be spending considerable resources on meeting a constituent level when the environmental problem is caused by urban runoff or agricultural drainage.

Legislation and regulations aimed at controlling pollutants constituent-by-constituent do not ensure environmental improvement and prevents the balancing needed to direct resources at the causes of water quality impairment.

CASA and other POTWs are capable of responding to problems without delay. Recent EPA awards in excellence testify to this fact. However, because a POTW is easily identified for evaluation on a constituent-by-constituent basis, EPA and the states are targeting POTWs without considering what other ways may be appropriate to clean up the problem. Ironically, a POTW discharge may represent only one percent of a specific pollution problem, but almost 100 percent of the regulatory agency's response may be directed at this portion. Such a plan of action fails to address the priority mission—responding to circumstances that pose environmental harm or impair the water's beneficial use.

CASA raises this matter because the limited ability to finance necessary controls and the outstanding priorities for compliance with the Clean Water Act require Congress to reexamine this situation.

CASA is dedicated to improved water quality and we do not urge exemptions from section 304(l). Instead, flexibility to address sources of pollution posing long-term environmental harm or beneficial impairment of a water body in question should be allowed. Targeting constituent-by-constituent toxic levels without consideration to actual impact or major source is a wasteful use of limited water pollution control resources.

We need to set priorities. Cleanups that target contributors, through sections 303(c)(2)(B) and 304(l), without reference to the ultimate improvements in water quality impair our ability to attain clean water goals. We need to direct such activities to target the major contributors to the pollution problem.

Quite simply, meeting environmental mandates in the future requires study to determine if the approaches used in the 1970s and 1980s will work for the problems of the 1990s. Cross-media impacts, balancing waste allocations, and local mass emission strategies will emerge as effective tools for the future as "end of pipe" regulations prove themselves outdated approaches.

This concludes my formal testimony. I would be pleased to respond to any questions you or the other members of the subcommittee may have.

Mr. Nowak. Thank you for your testimony, Mr. Miller. As you were going through your various statements, I was trying to figure out when we talked, and you mentioned in your last statement about priorities, and how we take a body of water, how we consider the contributors to that total pollution base. I guess the earlier testimony, also, talking in terms of CSOs and the tremendous investments we have made in secondary treatment have not given us those benefits. I was talking with the staff here a minute ago, asking how we could accomplish mass balancing of those priorities that are contributors.

If a great deal of attention is turned just to the one aspect of sludge, and the determination is made to spend tremendous amounts to go up another degree in the secondary process—would we be better off spending more attention on and rearranging those priorities to stop some type of urban runoff or separate the sewer systems? Should we look at the problem of the overflow? I guess it is a local, individual sewer district by sewer district analysis to see what is coming into the system.

Is that what you are looking for in your new water pollution control act?

Mr. Miller. Mr. Chairman, fortunately or unfortunately, in the state of California, the CSO problem is not as prevalent as it is in other states. Most of the older areas are faced with that dilemma. Also in the state of California, especially in the southern portion, reclamation, tertiary treatment, the next level of treatment, so to speak, from secondary, is really on a roll. There are lot of projects that are in and functioning very well, saving considerable amounts of potable water usage, the watering of green areas, and so on.

There have been tremendous strides made, and I am sure that there are some areas of the country where the priorities are different. Maybe that's not a good answer to your question, but I think it is a priority item by area.

Mr. Nowak. In your area, you don't have CSOs, but do you have any agricultural runoff?

Mr. Miller. Yes, we do.

Mr. Nowak. Is there anything that anybody grows—rice, for instance, in your valleys and other crops? Are grapes fertilized?

Mr. Miller. Definitely.

Mr. **Nowak**. Tomatoes, vegetables, peaches, pears, plums?

Mr. **Miller**. Non-point is a bear. It is really going to be a very difficult problem.

Mr. **Nowak**. Who makes the determination now of how much of your state and federal loan program that you are involved in goes to non-point rather than tertiary treatment?

Mr. **Miller**. The state of California would make that decision. To the best of my knowledge, non-point really has not been addressed to any degree at all at this point. Everybody knows it is a problem that is going to happen but it really has not come up as of yet.

It is a big problem out there on the horizon, and how are we going to take care of it? Right now, the revolving loan program really is to move those areas that are not at secondary treatment. Those areas that have to complete what they started under the grant program, and now are in the revolving loan fund program.

Mr. **Nowak**. So you are not devoting much of that money then, that 20 percent that could be used for these other non-point source categories?

Mr. **Miller**. My understanding is that that much has not been done on the non-point field at this point.

Mr. **Nowak**. But the state is making the priority determinations as to where the money is being allocated, under the state revolving loan program? Is that correct?

Mr. **Miller**. That is correct.

[The prepared statement of Mr. Miller appears on page 295.]

Mr. **Odeal**. Mr. Chairman, if I might just touch on that in terms of what AMSA I think is talking about, not necessarily that we totally believe that what the world needs is more legislation, but I think we want to present a philosophy that really you can't come up with one standardized pollution requirement and stuff it down local throats. Particularly as we move beyond the secondary, we have to assess basin by basin, discharge by discharge as was pointed out relating to CSOs. We have to determine what the impacts are and what the benefits will be.

Unfortunately, this is not being done because it is costly. However, it is still orders of magnitude cheaper than simply saying we are going to eliminate all overflows or we are going to provide AWT everywhere. We feel very strongly that dollars have to be invested in good science and good water quality work so that we know where best to spend the capital dollars, and minimize the capital dollars.

Mr. **Nowak**. When your organization looks at your own membership, you have mentioned the states and localities interest in more flexibility in dealing with the total water quality program, and when we look at those priorities that are in the present legislation, and the possibility of including or broadening the program to include CSO and perhaps other initiatives that have not been discussed today, is that the general direction your organization is looking toward?

Mr. **Odeal**. That's correct, Mr. Chairman.

Mr. **Nowak**. How would you envision that we could accomplish that goal of greater flexibility? I am trying to devise something that you can get the greatest bang for the buck, as they say in this total area. What do we need to provide you with in addition to what is in the law now?

Mr. ODEAL. I think, Mr. Chairman, first of all, as has been pointed out several times, is that the local agencies have a tremendous amount of technical resources available. Rather than being referred to fondly as a regulated community, we are really the partners. We would like to be very much involved with regulations and standards are written.

We think also that of the monies that are available, if more monies were directed to some basic water quality research and more support was given for local investment so that rather than simply saying here is your permit, the localities would develop the water quality implications. There are some excellent examples of that, for instance San Francisco has an excellent water quality tailored CSO program that tailors the capital requirements to the water quality impact of the uses. That can greatly reduce the costs.

I think what we are saying is we would really not like to see arbitrary standards or time frames that are simply too short. Personally, the CSO problem, if we are going to take care of it right, it going to take some 10 to 20 years to correct, it will take several years to adequately quantify, and even if we had the $50 billion or $60 billion or whatever number we obviously can't spend it in five years.

We have to have reasonable time frames, a reasonable assessment of the problem, and local participation in developing the solutions to those problems.

Mr. NOWAK. You mentioned in your testimony the reassessing of pollution control priorities. Under that kind of a general statement, where would you specifically suggest that we broaden the program?

Mr. ODEAL. A number of issues have been talked about. I think we are going to have some dollars put into the CSO problem, and we are going to have to have some economic incentives to addressing the non-point problem, particularly the really tough one, obviously, the agricultural problem. Unfortunately, the easier one is always the local discharge, the POTW, and that's the one we continue to ration down on, so we would like to more flexibility in terms of this CSO issue and also trying to develop some incentives and even utilize what is available through the Department of Agriculture, some land management techniques, to control some of the runoff.

Mr. NOWAK. When you look at your membership and your experience, Mr. Odeal, when do you consider that total pollution impact in a given area? I know they all vary, but can you give us any indication of what CSOs and non-point source and perhaps urban runoff would total out of 100 percent that is in an area with secondary achievement already?

Mr. ODEAL. One of the problems I think when we talk about secondary treatment, we are talking about water quality standards which are generally structured around dry weather flows. We are not talking about non-point CSO and stormwater events, we are talking about flows. So the conditions that might prevail in a river system where it is quickly moved away versus what may prevail in the Great Lakes where what gets discharged tends to stay or in an estuary, would be radically different.

I don't know that we specifically—it would be nice if we had some great numbers, and that's why you see the ranges of dollars that people say it is going to cost, the ranges of magnitude of the problem. I think it is disappointing that 20 years after the Act we still don't have a handle at all on one of the major problems in the country, CSOs. I feel a little ashamed as a professional in the business that I don't have better information, but I just don't think we have good information today on the problem.

Mr. NOWAK. Let me turn to one other thought I had. Mr. Wagner, when you talked about sludge, and ocean dumping, I understand that all of the communities, including those in New Jersey, are now moving into some different technologies for the sludge, is that correct?

Mr. WAGNER. That's correct. All communities have entered into enforcement agreements with EPA and the states and through interim measures will be ending ocean disposal in 1991 or mid-1992.

Mr. NOWAK. Do you have any idea what that cost is going to increase to in the area?

Mr. WAGNER. We have not finished our long-range planning for sludge processing, but the initial phase which is a dewatering phase, which we are moving forward with rapidly, because that is needed in any event, will cost the city about $600 million in capital costs. Added to that will be the additional capital costs for further processing and disposal.

Mr. NOWAK. I understand the city has already raised its water and sewer rates to start the process?

Mr. WAGNER. That's correct.

Mr. NOWAK. So it will be met?

Mr. WAGNER. Yes. For both our basic wastewater treatment construction program and the sludge program, the water and sewer rates have more than doubled in the last few years.

Mr. NOWAK. You have all brought us some very enlightened testimony, and we will have the opportunity to go over it some more. We will leave the record open, because I think there are a lot of gaps we have to try to fill in before we try to move forward in this area.

Again, I want to thank each of you for attending and presenting your associations' and your individual views.

We will leave the record open for additional questions as we have the time to go through all the testimony. Let me bring to the witness chair now Mr. James E. Murray, who is the Director of Public Works, Department of Public Services, in Wayne County, Michigan.

STATEMENT OF JAMES E. MURRAY, DIRECTOR OF PUBLIC WORKS, WAYNE COUNTY, MI

Mr. MURRAY. Thank you, Mr. Chairman. I appreciate the opportunity to be here on behalf of Ed McNamara, the County Executive from Wayne County.

The hour is growing late, and I can appreciate the amount of work that you personally put into this. I will try to be as quick as possible. I am always reminded by our parish priest that what the mind can absorb is a function of what the seat can endure.

Ed McNamara made a commitment when he came to office in Wayne County, which had 2.3 million people in it three years ago that the Rouge River Basin and the E-Course Basin, the Detroit River and Lake Erie were tremendous important resources to not only Michigan, but the entire Great Lakes Basin.

He also made a commitment to the residents of Michigan and the Great Lakes Basin, he felt that we were all down-streamers, and that we must start to work toward water quality improvements that are in the best interest of that resource and of the country.

Today the United States has reached a benchmark in its water quality objectives, that is it is has virtually controlled the point sources of discharges into the open environment, at least our surface waters. If they are not completely under control, they are on a schedule for control. The passage of the Clean Water Act in 1972 has provided dramatic improvement to the nation's surface waters. Rivers that once burned are now cleaner. Even Lake Erie, once considered destined to become a parking lot, has made a dramatic improvement and returned to beneficial uses.

Throughout the nation, similar success stories abound. Progress made to date is attributable to the tremendous effort by the nation's leaders to provide direction and funding necessary to accomplish what has been achieved. However, in light of our success, the nation's waters still remain threatened. Pollutant discharges into the water during wet weather events has been documented to impair surface waters beyond acceptable limits and threaten the long-term sustainability of our surface water resources.

Since the passage of the Clean Water Act, the Federal Government has struggled with the regulatory approach to controlling wet weather discharges. At every attempt it has proved difficult, if not impossible to move forward. Only in limited areas, at great federal and local expense, has any meaningful attempt been made to control wet weather discharges.

In an effort to move ahead with the charge of the Federal Clean Water Act, the U.S. EPA has moved to implement a combined sewer overflow discharge regulation program, and is also moving ahead with rules for controlling non-point sources of pollutant discharges. Even though these discharge events occur only in wet weather and the control mechanism available for control of the discharge to both are essentially the same, the Federal Government has failed to integrate these programs.

The result is the emergency of a tremendously expensive program that has very little chance of implementability. For instance in Michigan, the Michigan Department of Natural Resources, in conjunction with the EPA, has initiated a CSO strategy to control CSO discharges. The emphasis of this program is the construction of facilities at the end of the pipes. The proposed CSO strategy could cost Michigan taxpayers $4–$5 billion to implement. In southeast Michigan alone the cost could reach $3 billion.

In Michigan, the CSO strategy does not consider water quality impacts from separated storm sewers. These older urban areas are downstream from development. In upstream areas, it is our contention there will not be one minute of change in the water quality of the receiving storm even with this $3-$5 billion expenditure in Michigan. Regulations for controlling discharges from separated storm water sewer areas is currently emerging. Studies conducted under the 108 and NURP programs indicate that pollutant loads of this type in urban ares contribute significant pollutant loads to our surface waters. The requirements for meeting the proposed storm water discharge requirements could easily equal that estimated for meeting the cost of the proposed CSO program.

As of yet, the EPA and MDNR have not tried to integrate the CSO and storm water discharge control program. Since both discharge only in wet weather, we feel greater pollution control, program efficiency, and cost savings can be realized by integrating the program. Wayne County has developed a proposal to integrate these programs, provides the framework by which such integration could occur and will document the achievability of the approaches outlined. It is felt that as much as 50 percent of the program cost for CSO control can be saved. Comparable cost for storm water controls could also be achieved.

I have attached small studies began in Washtenaw County and Wayne County to the proposal which suggest why we have come to this conclusion. These studies point out that many of the problems of water quality in urban stormwater discharges will be lessened by the implementation of certain best management practices.

By following the proposed approach instead of the proposed Federal CSO and NPS programs the following deficiencies in the federal program will be avoided. The NPDES stormwater regulations are not in effect for many municipalities and industries and the required level of control stormwater has not been defined in the regulations.

BMPs for CSOs are identical to that of stormwater, since CSOs are mostly stormwater. By limiting upstream discharges less sediment contribution and less volume and time of peak CSO could be realized. The level of control required has not been defined in regulations for CSO under wastewater treatment plant NPDES permits.

Where large-scale structural EPA partially funded CSO and stormwater projects have been undertaken the costs have been excessive. A BMP approach with non-structural solutions and public involvement is required from a cost standpoint. Imagine the collection system as a river basin in need of flood control. It may be more effective to construct many small dams, detention basins, rather than one large dam.

For instance, the TARP in Chicago. TARP, while being off line, requires that all the water discharged at the peak of the storm be collected. Multiple detention basins at thousands of points will dampen the peak and allow a much smaller TARP to solve the water quality problem. This also has the effect of sharing the capital and O&M cost between the public and private sector.

The method for targeting areas can be more simply determined. Branches of streams with the highest exposure and value to the public such as the Middle Rouge would be cleaned up first, from the headwaters down to the mouth. Often, factors other than those listed in the ranking procedure, political and institutional arrangements, available site, public involvement, determine where BMPs will be tried.

The Urban Targeting report is based on information and studies which are generally about 10 years old. Public awareness has increased dramatically in this time of environmental pollution. Air quality has improved in most urban areas with stricter control of auto and industrial emissions. Many BMP's require public involvement and overlap with solid and hazardous waste control programs currently being put in place. The report states on page 40, and the reporter speaking to you is the urban targeting BMP selection EPA Document No. 68C80034. On page 40 under 3.5.2, it says "There is no realistic way to accurately estimate the effect such practices may have on an area-wide pollutant load or to problems in specific water bodies". An increased public awareness and the economic realities make it necessary for us to try and test non-structural BMPs again.

Some investigations of sanitary sewer systems are necessary to ensure that storm water drainage to sanitary sewers is eliminated as much as possible. Illegal discharges to sanitary sewer systems can cause problems such as wet weather backups and flooding.

The information gathered on BMPs in the Middle Rouge will be transferable to other urban areas with combinations of CSO and storm drainage districts. Public acceptance and involvement of BMPs and solid and hazardous waste measures will be estimated along with water quality improvements derived from the BMPs.

The Urban Targeting report does not address the institutional changes that are necessary to implement a BMP. Urban storm water control at the source will become like curbside recycling. It is politically difficult to implement a program which causes the citizenry to perform a task that has been traditionally a DPW task. Public awareness and a desire to be environmentally responsible change the way the public accepts these responsibilities. Storm water and CSO control can be solved by massive public works projects, but at a time when public funds are shrinking, a more cost-effective method is required.

Combined sewers are specifically excluded from this report by choice, but the same aspects driving urban storm water problems drive CSOs, that is, increased peak discharge, runoff volume, decreased response time.

Using the event mean concentration assumes the goal is to catch everything and blinds the statistics to the effect of antecedent conditions. The 208 studies show that more pollutants are caught by capturing the one-month storm than the one-year storm. Using the event mean concentration makes one focus on the large events because of the high volumes. Instream response data, sufficient to document water quality improvement and justify capturing these events is necessary if implementation of any meaningful water quality program funded primarily at the local level is to be achieved.

Limitation for both detention and retention devices should include maintenance and solids handling. Source controls such as enforcement should be in place. We need to reduce sheet and land surface sources of pollution, and identify and control runoff from abandoned industrial facilities.

By and large, the Federal Government's report is a typical 208 document. It says all the right things, but is backed by very little data and ends each section with "There is no realistic way to accurately estimate the effect such practices may have on area-wide pollutant loads or to problems in specific water bodies" or "There is no magic formula that can be applied to decide for a user the most appropriate priority to assign for a general implementation program".

These sentences alone justify the proposed study. The Federal Government has placed a huge burden on the local communities. While the grant program was alive and well, it was decided that NPS projects and CSO projects were not cost effective. Now that the Federal Government has passed the burden on to local governments, and cut and pasted from the same documents that killed NPS projects 10 years ago, it is time for a new approach.

This proposal will quantify, verify and document the achievability of the BMP in an urban area. It is a necessary effort to bridge the gap from where we left 10 years ago. For the local government to embrace this program and for the Federal Government to broaden its support for these needed water quality programs, real site-specific information must be collected.

With your support we can begin to shift the NPS problem from the public sector to the responsible party, where it rightly belongs.

I have a few comments I would like to add. We support the efforts of the previous speakers on this committee's oversight and involvement. One of the things I am not sure was recognized and what is being lost by the current CSO program is the secondary treatment that has been built under the construction grants program is being robbed by the implementation of the CSO program. Most of these facilities as they were being built were being built for a 20 to 30 year time frame into the future, understanding future growth.

With the implementation of CSO control strategies based at point source or control at the end of the pipe, we are taking up that excess capacity that was a set-aside for the future to treat the CSO program in the present. We think that transferring robs the bondholders of their equity and the future rates that will be paid by additional people coming into that system, and the expansion that is going to be necessary to pay those bonds in the future.

The partnership at the Federal, state and local level is an absolutely critical necessity in the CSO and non-point programs. We have to remember that rain events occur on an average of once every 3.65 days across this country. As a result of that, we cannot just build secondary or primary treatment at the end of the pipe. Best management practices are going to have to be considered if we are going to move forward from any successful program.

We have already heard the staggering costs. In southeast Michigan, \$2–\$3 billion, \$4–\$5 billion in the state of Michigan, would be necessary just for the current level of control EPA is suggesting in Michigan for CSO control. That will translate into \$500 to \$600 per household per year just in southeast Michigan. We believe that a different approach could bring that cost down to \$129 to \$130 per year with best management practices.

We also feel that the failure to integrate these wet weather conditions—non-point source, pollution control and CSO control—is completely inappropriate. If we move ahead with CSO control in southeast Michigan, perhaps in the Rouge Valley, the downstream area will have much better water quality. The upstream non-point sources and the lack of compatibility with the CSO program will not allow that river to have one minute's increased usability under the current standards and practices as we apply them to dry weather conditions.

So for a cost of $2–$3 billion in southeast Michigan, the Rouge River for lack of non-point source pollution control will not have one minute's difference in usability. The Washtenaw County study that is attached to the proposal and submitted to this committee suggests that in an area that has non-point source pollution in an urban area, 60 percent of the time that river system does not meet water quality standards for human contact. The ability to control that, even in areas where we know there are no illegal connections or toxic problems, cannot be achieved from the kinds of sources—wildlife and animal waste.

We are in agreement with the previous speakers that the application of dry weather standards that were based on low flow conditions for constant discharge into our surface waters are not applicable and we have to rethink how we develop those standards and how we implement them into a regulatory program.

I would like to thank this committee and the chairman for this opportunity to speak to you today. We look forward to working with you on this important element of the Water Quality Program that this country has embarked on.

We support this committee and the Congress in their efforts to return these waters to the goal of swimmable, fishable waters. We think the public is very supportive of the goal, but the application of that goal and how you apply that goal in wet weather is a crucial element that has not yet been addressed as we have gotten this far. We ask this committee's oversight as we move into the regulatory program of what needs to be done next.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Murray appears on page 305.]

[The prepared statement of Mr. McNamara appears on page 241.]

Mr. NOWAK. Thank you very much. I think you have made a lot of good points.

Is Wayne County part of AMSA?

Mr. MURRAY. Yes.

Mr. NOWAK. And you have a working relationship and a goal—I assume the tremendous amount of time that you have put into coming up with the alternatives here to what has been suggested by the state and Federal Government is a little costly, isn't it?

Mr. MURRAY. We think that the demonstration project in Wayne County that we are proposing, spread over a five-year period, and the Rouge River is a fairly small basin, it is 465 square miles, and has 1.5 million people living in the lower, heavily urbanized, partially CSO areas. Many sub-basins are separated by doing a controlled BMP project before and after we will be able to determine the achievability.

The Washtenaw County experience is a very limited one. What we have started in Wayne County suggests a 25 percent to 30 percent improvement in just the limited kinds of resources we have been able to suggest we start in the program. In light of the CSO program imposed in Michigan, through EPA and the Michigan Department of Natural Resources, we think we are losing the opportunity to go into best management practices.

Because of the tremendous costs some communities have small CSO areas and are deciding to separate the system at tremendous cost. That gets them off the hook, and the non-point source program is going to continue. Their exposure is great and the river, even though that cost has been incurred, will not have one minute's difference in its water quality or usability.

Mr. NOWAK. When you take this series of best management practices as they have been developed for the different aspects of this, to the state, what as a practical matter happens with the suggestions? How is it worked in or out of the system? Who makes that judgment?

Mr. MURRAY. The regulatory approach has been based on the administrative ease and the application of magic numbers viewed in standards. I used to be Chair of the Michigan Water Resources Commission. As a member of the commission, I supported strong standards and their application in Michigan. Those standards, because of the cost of implementation of limits at the end of pipes, we set those standards knowing that five percent of the time during low flow conditions POTWs would not be required to meet the limits, or the limits that they met would not be protective of the receiving water.

The reason we had to rethink that we could not protect the receiving water 100 percent of the time was that the remote occurrence of that happening and the impact on the resource did not justify the tremendous costs. We have failed to take that philosophy and apply it to wet weather. There is a tremendous amount of negotiation, a tremendous interest among all the regulating community and the environmental community on what the applicability is and how it is imposed. In light of that, DNR and EPA are hesitant to embark on such a program, because of the difficulty of Wayne County, what is a systemic response to such a program and how do you set limits on a wet weather condition?

I think we all agree a river flowing at peak flow is much different than a river flowing at drought flows. The application of standards and implementation of standards is a difficult process and it is not one the regulatory community wishes to embark on, or at least the regulating community.

In light of that, we are—and I think the entire nation as well—moving toward gridlock on how we are going to solve CSO problems. Our experience in Chicago, and Milwaukee and some of these other areas where we have tremendous amounts of resources into wet weather conditions with little improvement of the amount of time you can use the receiving waters has made us question how we are going to move forward with the regulatory program in wet weather. We are suggesting there are some other ways we need to measure that. Our science is better, our public knowledge and acceptability and responsibility have grown.

We do not see any public diminishment of their goal of achieving water quality that is acceptable and sustainable. The cost of it has to be considered, and how we move forward has to be more thoughtful.

Mr. NOWAK. Thank you very much. You have brought a new element to the Committee for consideration as we move along.

We are going to try to get in touch with the Michigan environmental people that have been working with the program, and also EPA to see if we can move forward with some of these goals you have mentioned. I think everyone would be interested in saving the kinds of dollars and spreading—being as cost effective as we can with the limited amount of dollars we are going to get for this program as we move through it.

Some of the lesser items that perhaps you have mentioned here really would have cumulatively substantial impact as you look down the line to that ultimate objective.

Again, I want to thank you for coming and giving us your testimony. We have copies of your total statements and we will start to move through them and we may call you back in Michigan for some explanation of parts of it.

Also we will probably share some of our staff's reaction with EPA.

Mr. MURRAY. I appreciate that, Mr. Chairman, and welcome the opportunity to work with you and the regulating communities.

Mr. NOWAK. Thank you, and again thank you for your patience. The Committee stands in recess until 10:00 a.m. tomorrow.

[Whereupon, at 1:46 p.m., the hearing was adjourned, to be reconvened at 10:00 a.m. the following day.]

PREPARED STATEMENTS OF WITNESSES

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3D DISTRICT, VIRGINIA

MEMBER OF
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STATEMENT OF THE HONORABLE THOMAS J. BLILEY, JR.
SUBCOMMITTEE ON WATER RESOURCES
MARCH 21, 1990

Combined sewers are found mostly in America's older cities. They were used before the development of wastewater treatment facilities to transport sewage out of the city and to the river or lake or stream. When water treatment facilities were developed new sewer lines were connected to the old to carry away the sewage to the treatment plant.

Unfortunately, these connecting sewers were made only to carry a normal wastewater flow. During heavy rains, the connecting lines are filled and the excess spills into the old sewer lines which flow directly into the river, lake or stream. This occasional incident has been determined to be a threat to our environment.

In August of 1989, the Environmental Protection Agency (EPA) issued its final National Combined Sewer Overflow (CSO) Control Strategy. This document required all States to develop a State-wide strategy by January 15, 1990 for the development and implementation of measures to reduce pollutant discharges from CSOs.

This strategy will affect approximately 1200 sewer systems nation-wide serving a population of 43,000,000. Documented needs for approximately two thirds of the CSO control measures totals $16.4 billion. According to the EPA this figure represents a mere 20% of all water treatment facility needs in the country.

In Virginia alone, the costs of correcting the extensive CSO problems in Richmond, Lynchburg and Alexandria are estimated to be in excess of $450 million. This figure is in stark contrast to the $40 million that Virginia received last year in Federal funds for all water treatment and sewer construction projects in the state.

The City of Richmond, which has a $294 million CSO plan, faces a dilemma that aptly illustrates the negative financial impact on localities nationwide if the current CSO strategy is implemented. The local cost of the first phase of Richmond's CSO plan, $73 million, has already raised wastewater utility rates 70% over a four year period. The

City is committed to spending another $27 million, the upper limits of its financial capability, to begin the second phase of its CSO plan. This will increase rates another 16% the first year and will average 10% over a 10-year period. Richmond's rates are now among the highest in Virginia. Additional planned expenditures for CSO control will raise them even higher. strongly support the environmental goals of the CSO control strategy; yet, I are very concerned about the burden that this strategy could place on our localities. I would like to be sure that this strategy is the most sensible, effective, and efficient method for reaching our goals. For this reason I respectfully request that your Subcommittee hold a hearing to explore the many facets of the CSO issue.

I believe that the funding dilemma alone warrants Congress' attention to the CSO issue; however, there are a other aspects of this issue that I feel Congress should address. Answers to a number of questions should be explored: Is the intent of Congress being executed? Does EPA's final strategy incorporate the proper flexibility to allow localities to make a response commensurate with the environmental goals and their financial abilities? Are state water control boards' interpretation of the strategy consistent with Congress' intent?

Thank you for this opportunity to raise these concerns before your Subcommittee. I look forward to the day when we can examine this question more closely.

TESTIMONY OF
CONGRESSMAN NORM DICKS
TO THE
HOUSE PUBLIC WORKS AND TRANSPORTATION
SUBCOMMITTEE ON WATER RESOURCES
MARCH 21, 1990

Mr. Chairman:

I appreciate the opportunity to appear today before you and the Members of this Subcommittee on Water Resources, receiving testimony on the reauthorization of the Federal Water Pollution Control Act, enacted in 1972, now known as the Clean Water Act.

As we prepare to celebrate the 20th Anniversary of Earth Day next month, I think it is important to view the profound impact that the Clean Water Act has had on pollution control efforts throughout our nation. Before seminal events such as Earth Day, and before our awareness was raised about the fragile nature of our nation's rivers, bays and offshore waters, we engaged in many practices that are now demonstrating effects that threaten the health and safety of many of these bodies of water.

The Federal Water Pollution Control Amendments of 1972 and the Clean Water Act Amendments that have been passed since that time have established a comprehensive approach to cleaning up the nation's waters. They have set a regulatory framework for the implementation of pollution control technologies, and for control of the discharge of industrial and municipal waste discharges. And they have set us on a course toward the restoration of many of the nation's most important bodies of water, including the Great Lakes, Narragansett Bay and the Chesapeake Bay.

I am appearing before this subcommittee once again today to call attention to another threatened body of water--one which provides economic sustenance and cultural distinction to the Pacific Northwest. Puget Sound in Washington State is perhaps our most precious natural resource: a largely pristine estuary which serves as the focus of nearly 3 million of our State's citizens concentrated around its shores. It is a marine environment rich in fisheries resources; it provides abundant wildlife habitat; and, as our "superhighway," it represents the source of international commerce that is a central force in our economy. Beyond the tangible aspects of Puget Sound, I believe there is every bit as much a cultural connection to the waters of Puget Sound for the people of Washington State as there is for the oystermen of Chesapeake Bay. Just as the Sound confers its physical influence on our geography, it influences the very character of the people and the lifestyles of the Pacific Northwest.

But just as the Chesapeake Bay has suffered the impacts of growth and development, the pristine jewel of the Pacific Northwest is threatened even more profoundly by the rapid growth of what is known as one of America's most liveable places to live.

The early symptoms of a grave illness have clearly been evident in Puget Sound for more than two decades, as industrial contaminants, municipal sewage discharge and non-point source pollution have taken their toll on the water quality. Toxic "hot spots" in almost all of our urban bays have been discovered and have been linked to serious diseases in several species of bottomfish. Bacterial pollution has caused the closure of what used to be very rich shellfish beds. More than half the Sound's original wetlands have been eliminated by shoreline development. And the nearly-incalculable "non-point" source pollution problem is perhaps the more difficult of all to control--the disposal of household chemicals, oil, gasoline, and other contaminants carried passively into the water system through streams and sewers.

The prognosis for this illness is not good, with another 600,000 people expected to migrate to the State by the year 2000, bringing with them even greater development-related problems to the Sound's marine environment.

As the members of this Subcommittee may know, the Pacific Northwest is a region marked by an exceptional awareness of environmental and natural resource protection. Decades before Earth Day in 1970 we were marshalling the forces of civic activism and expending public funds to combat the damaging impacts of population growth on Lake Washington and other important waters. We have been concerned. We have been working hard on the complex issues involved in a Puget Sound Cleanup program. With the assistance of the

Environmental Protection Agency, the Puget Sound Water Quality Authority has been actively and aggressively pursuing a management plan for Puget Sound which combines basic research and attention to remedial strategies, where possible.

Puget Sound was designated an "estuary of national significance" in the 1988 Clean Water Act Amendments, and we have received about $1.6 million each year since 1984 in EPA funding as the federal share of the cleanup program, through the national estuary program. The State of Washington has gone far beyond the federal government's efforts, establishing a dedicated cigarette tax revenue base for the Puget Sound Water Quality Authority's management plan. Local jurisdictions are also contributing--in some cases substantial amounts.

At this point, the strategy in Puget Sound must move from concept to action.

In the last Congress and again in the 101st Congress the Washington Congressional Delegation has proposed the establishment of a specific designation within the Clean Water Act, through which increased federal support for the cleanup effort can be channelled.

What we are talking about is a separate line-item to establish a timetable and a funding profile for federal support of the cleanup program for our nation's second largest estuary. This is what we have done for the Chesapeake Bay program, for Narragansett Bay, for the Great Lakes, and for a select few other critically important bodies of water.

I have introduced H.R. 2670, a bill to authorize a $100 million Puget Sound program, and I am asking this subcommittee to consider today the addition of this legislation to its package of amendments to the Clean Water Act or any other appropriate authorizing vehicle in this session of Congress. This funding limit would be established, from which we would request annual appropriations over a 10-year period or longer for monitoring, research, and other activities related to improving the water quality of Puget Sound.

An enhanced level of annual funding from the federal government can assure that the Puget Sound Water Quality Authority's monitoring program can be accelerated to keep pace with developing pollution trends. In addition, this comprehensive water quality control effort will sustain many other programs related to water quality in Puget Sound, including: an annual inventory of shellfish bed contamination, the search for unpermitted discharges into Puget Sound, an inventory of contaminated sediment sites, urban stormwater programs, and wetlands inventories.

With a more aggressive level of funding, we will be able to conduct a more aggressive research program in critical areas. In order to be able to protect marine organisms, in particular, we need to know more about the natural variations and cycles in the living population in the Sound.

Mr. Chairman and members of this Subcommittee, I am urging today your most serious consideration of this request--a request to make the federal government a more active participant in the cleanup of one of the nation's most important and most threatened bodies of water.

Specific designation of the Puget Sound cleanup program will allow for more substantial "preventative action" that will, in the long run, save taxpayer money as well as preserve our State's most important natural resource.

Thank you.

STATEMENT OF REPRESENTATIVE NITA M. LOWEY
BEFORE THE SUBCOMMITTEE ON WATER RESOURCES
MARCH 21, 1990

MR. CHAIRMAN, I THANK YOU FOR THE OPPORTUNITY TO APPEAR BEFORE THE SUBCOMMITTEE TODAY.

IT IS TRULY A PLEASURE TO APPEAR BEFORE THIS SUBCOMMITTEE BECAUSE THE CHAIRMAN HAS SUCH A DISTINGUISHED RECORD OF SUPPORT FOR THE ENVIRONMENT, AND FOR CLEAN WATER IN PARTICULAR, AND THE OTHER MEMBERS OF THE SUBCOMMITTEE HAVE DISTINGUISHED THEMSELVES ON THIS ISSUE AS WELL.

I COME BEFORE YOU TODAY TO DISCUSS THE PRESSING NEED FOR FEDERAL FUNDING TO UPGRADE THE MAMARONECK SEWAGE TREATMENT PLANT IN WESTCHESTER COUNTY, NEW YORK.

THIS IS A MATTER OF URGENT IMPORTANCE, NOT ONLY TO MY CONGRESSIONAL DISTRICT, BUT TO THE ENTIRE LONG ISLAND SOUND REGION.

LET ME BE FRANK. LONG ISLAND SOUND IS IN DANGER OF DYING. AND IF IT DIES, THERE WILL BE SEVERE CONSEQUENCES, NOT ONLY FOR MY CONGRESSIONAL DISTRICT, WHICH BORDERS ON THE WESTERN PORTION OF THE SOUND, BUT FOR AN ENTIRE REGION OF NEW YORK, CONNECTICUT AND EVEN RHODE ISLAND. UNLESS WE BEGIN WORK NOW TO REVERSE THE DECLINE OF THIS VITAL ESTUARY, WE WILL SUFFER LOSSES OF UNIMAGINABLE PROPORTIONS -- ECONOMIC LOSSES...RECREATIONAL LOSSES...THE LOSS OF OUR VERY QUALITY OF LIFE. ALREADY, FISHING AND SHELLFISHING HAVE BEEN HARMED SEVERELY. BEACHES ARE CLOSED ON A REGULAR BASIS. THE PICTURE AHEAD LOOKS BLEAK UNLESS WE ACT NOW TO BEGIN SERIOUS CLEAN-UP EFFORTS.

CURRENTLY, THE ENVIRONMENTAL PROTECTION AGENCY IS COMPLETING THE LONG ISLAND SOUND STUDY, WHICH IS A COMPREHENSIVE REVIEW OF THE POLLUTION PROBLEMS THAT ARE NOW FACING THE SOUND. HOWEVER, SOME OF THE FINDINGS HAVE ALREADY BECOME AVAILABLE, AND THEY SUGGEST THAT THE ONE OF THE MOST IMPORTANT PROBLEMS FACING THE SOUND IS THE LACK OF ADEQUATE TREATMENT OF WASTE WATER.

THE MAMARONECK SEWAGE TREATMENT FACILITY IS THE ONLY SEWAGE TREATMENT PLANT IN THE ENTIRE LONG ISLAND SOUND REGION WHICH IS CURRENTLY OPERATING AS A PRIMARY TREATMENT FACILITY. IT SERVES 79,500 PEOPLE AND IS LOCATED NEAR SOME OF THE MOST FREQUENTLY CLOSED BEACHES ON LONG ISLAND SOUND.

THAT IS NO COINCIDENCE. AFTER EVERY RAINFALL OF OVER HALF AN INCH, THE FOUR MAMARONECK BEACHES MUST BE CLOSED FOR UP TO THREE DAYS BECAUSE OF HIGH BACTERIA COUNTS. BUT IT IS NOT ONLY THE MAMARONECK AREA THAT IS AFFECTED. THE INADEQUATE TREATMENT PROVIDED AT THE MAMARONECK SEWAGE TREATMENT FACILITY IS HARMING THE QUALITY OF WATER THROUGHOUT THE SOUND REGION. AN UPGRADE OF THIS PLANT IS ONE OF THE MOST IMPORTANT STEPS WE CAN TAKE TO HELP SAVE THE SOUND.

THERE ARE EFFORTS UNDERWAY TO UPGRADE THE MAMARONECK FACILITY TO THE SECONDARY TREATMENT LEVEL, AND THE FEDERAL GOVERNMENT HAS CONTRIBUTED SOMEWHAT TO THESE EFFORTS. HOWEVER, THE CONTRIBUTIONS HAVE NOT BEEN SUFFICIENT, AND THEY THREATEN TO LEAVE OUR LOCAL COMMUNITIES WITH A CHOICE BETWEEN AN ENVIRONMENTAL CALAMITY OR TAX INCREASES SO BURDENSOME THAT THEY ARE UNTHINKABLE.

WHEN THE UPGRADE OF THE MAMARONECK PLANT WAS FIRST

CONCEPTUALIZED, THE COST OF THE PROJECT WAS ESTIMATED TO BE APPROXIMATELY $70 MILLION. SINCE THEN, PROJECTED COSTS HAVE RISEN BY MORE THAN $60 MILLION. AT THE SAME TIME, BUDGET CUTS BY THE REAGAN AND BUSH ADMINISTRATIONS HAVE DEPRIVED MAMARONECK OF MUCH-NEEDED FEDERAL DOLLARS. THE RESULT IS A SHORTFALL IN FUNDING THAT THREATENS TO PREVENT COMPLETION OF THE PROJECT OR REQUIRE A TAX INCREASE TO LOCAL TAXPAYERS OF AS MUCH AS 400 PERCENT.

MR. CHAIRMAN, NO COMMUNITY SHOULD BE FACED WITH SUCH A CHOICE, PARTICULARLY WHEN THEY ARE ATTEMPTING TO FULFILL A MANDATE THAT WAS ESTABLISHED BY FEDERAL LAW. INSTEAD, THE FEDERAL GOVERNMENT SHOULD PROVIDE ADDITIONAL ASSISTANCE TO THIS COMMUNITY WHICH IS STRUGGLING WITH THE ENORMOUS COSTS ASSOCIATED WITH COMPLETING THIS PROJECT OF CRITICAL REGIONAL SIGNIFICANCE.

WE ALL RECOGNIZE THAT ENVIRONMENTAL PROTECTION MUST BE A TOP PRIORITY FOR OUR NATION AT THIS TIME -- NOT BECAUSE IT IS NICE TO HAVE A CLEAN ENVIRONMENT, BUT BECAUSE IT IS ESSENTIAL TO OUR FUTURE AS A NATION. WE MUST PRESERVE OUR NATURAL RESOURCES IF WE HOPE TO ENSURE OUR ECONOMIC STRENGTH AND PROTECT THE HEALTH OF OUR CHILDREN.

NOWHERE IS THIS MORE TRUE THAN IN THE LONG ISLAND SOUND REGION. OUR ECONOMY AND OUR VERY QUALITY OF LIFE DEPEND UPON A CLEAN AND HEALTHY SOUND. AND UNLESS WE UPGRADE THE MAMARONECK FACILITY, WATER QUALITY IN THE SOUND WILL CONTINUE TO DETERIORATE, AND THE FUTURE OF OUR ENTIRE REGION WILL BE CALLED INTO QUESTION.

MR. CHAIRMAN, I HAVE GREAT RESPECT FOR YOUR RECORD ON THESE

ISSUES. NOT ONLY HAVE YOU DEMONSTRATED YOUR UNDERSTANDING OF THE IMPORTANCE OF CLEAN WATER TO THE FUTURE OF OUR NATION, BUT YOU HAVE REPEATEDLY ACTED TO PROTECT OUR ENVIRONMENT AND TO PRESERVE OUR PRECIOUS NATIONAL HERITAGE. I AM GRATEFUL TO YOU FOR LISTENING TO MY TESTIMONY, AND I AM VERY HOPEFUL THAT I WILL BE ABLE TO WORK CLOSELY WITH YOU AND THE OTHER MEMBERS OF THIS COMMITTEE IN ADDRESSING THIS VERY CRUCIAL ISSUE IN THE MONTHS TO COME.

ONCE AGAIN, THANK YOU VERY MUCH FOR YOUR ATTENTION.

WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES
DIVISION OF PUBLIC WORKS

EDWARD H. McNAMARA
COUNTY EXECUTIVE

JAMES E. MURRAY
DIRECTOR
224-3630

WAYNE COUNTY
DEPARTMENT OF PUBLIC WORKS

THE RIVER ROUGE BASIN WIDE WATER QUALITY MANAGEMENT PROGRAM

A
NATIONAL DEMONSTRATION PROJECT

TO ACHIEVE NATIONAL WATER QUALITY GOALS AND OBJECTIVES DURING WET WEATHER EVENTS

February 1990

415 CLIFFORD
DETROIT, MI 48226
(313) 224-7600

Wayne County Department of Public Works
The River Rouge Basin Wide Water Quality Management Program to Achieve National Water Quality Goals and Objectives During Wet Weather Events

February 1990

Goal Statement

The goal of this project is to develop a basin wide water quality management program that will achieve national water quality goals and objectives for wet weather events in the Rouge River basin. This program is to build on the studies done under Section 208 of Public Law 92-500, the Nationwide Urban Runoff Program (NURP), the National Pollutant Discharge Elimination System (NPDES), and the Industrial Pretreatment Program (IPP).

Objectives

The objectives of this program are:

1) to understand the connection between water quality standards necessary to achieve national water quality goals and objectives for dry and wet weather periods;

2) to describe the pollutant reduction and resulting water quality improvements of innovative Best Management Practices (BMP's) control pollutant loading at the site of origin in the basin instead of at the stormwater or combined sewer outfall;

3) to quantify the cost of water quality improvements resulting form BMP's or control structures or a combination of BMP's and control structures; and

4) to identify the institutional changes necessary to implement a BMP program that can accomplish the goal statement.

Under this program, the pollutant concentrations and loadings to the Rouge River from both combined sewered areas and separate storm sewered areas will be quantified with or without BMP's and control structures in-place. The data are to be used to perform the following:

1) estimate the pollutant load to the Rouge River;

2) define the characteristics of these pollutants;

3) identify sources of loadings (e.g. rainfall, atmospheric fallout, industrial wash off, illegal connections, industrial/commercial discharges, combined sewer overflow (CSO), etc.);

4) implement and test the effectiveness of some BMP's;

5) design, build and test CSO and stormwater control structures;

6) investigate the effectiveness of treatment technologies at CSO and stormwater control structures especially in regards to removal of toxics;

7) identify practical problems with BMP's and treatment technologies with specific emphasis on solids handling at control structures; and

8) summarize the data in a format that can be used in conjunction with modeling efforts to provide the basis for basin wide planning.

Introduction

With the American people demanding a concerted effort to improve the environment, the Federal government is using its regulatory authority to mandate local governments to better control pollutants being discharged from wastewater treatment plants, stormwater outfalls, and CSO to our surface waters. Unfortunately, there has not been a national strategy which recognizes the interrelationships of these pollutant sources. The industrial pretreatment and combined sewer overflow programs are currently in front of other Federally mandated programs such as stormwater control. The goal of this program is to use the Rouge River basin to demonstrate how Best Management Practices (BMP's) coupled with public works projects can restore water quality. Another goal is to determine the effectiveness of traditional treatment technologies.

particularly as they relate to controlling toxic pollutants being discharged to surface waters from urban watersheds.

Since the mid-seventies the Federal government has been interested in controlling pollutants from non-point sources. The studies required under Section 208 of Public Law 92-500 in the 1970's spent a great deal of effort estimating the quantity and quality of stormwater. Unfortunately, because the pollutants in stormwater generally were not the specific responsibility of a given individual, company, or community, the enactment of abatement procedures for stormwater control have largely been ignored. The Water Quality Act of 1987 on the other hand has specific permitting requirements for stormwater for industries and large municipalities. These requirements, coupled with the existing push by the regulatory agencies for the control of CSO has brought stormwater control back to the forefront.

The shortcomings of the current regulatory push are consistent with those of the water quality management plans prepared under Section 208 of Public Law 92-500. Best Management Practices were identified in the plans but a way to implement these BMP's did not exist. Large and costly public works projects are administratively easier to implement than basin wide BMP's. This statement does not mean that large public work projects will not be needed to restore surface water quality. However, the Federal deficit coupled with the elimination of the Construction Grants Program necessitates that non-structural alternatives for improving water quality be reconsidered.

Just as the NPDES program used the IPP to eliminate toxics from wastewater treatment plant collection systems, the stormwater and CSO control programs will force the in-system users to better manage their stormwater.

The current Federal regulation of CSO has resulted in communities being encouraged to separate combined sewer systems. Sewer separation is an extremely expensive alternative and is based on the premise that stormwater is sufficiently clean to not need treatment once the system is separated. The NURP data suggests the contrary. Urban stormwater can have significant amounts of pollutants such as suspended solids, biochemical oxygen demand (BOD), toxics, metals, oil and grease. Thus there is concern by the Wayne County Department of Public Works that local communities will separate the combined sewer systems at an enormous cost in an effort to avoid building treatment facilities at each combined sewer overflow point. The local communities may later discover that those same points require treatment facilities for stormwater.

The premise of this program is that there are two distinct sources of surface water pollution which are not already controlled: 1) stormwater and the pollutants it collects from the watershed; and 2) sewerage which is combined with excessive amounts of infiltration/inflow and/or stormwater and overflows as result of a lack of storage or treatment capacity in the sewerage system. There are different treatment technologies and management practices which address each of these two sources. It is therefore a goal of this study to define the characteristics of the pollutants at the point of discharge so that control structures and BMP's can be evaluated before widespread capital improvements are initiated.

Program Elements

There are seven program elements under the basin wide water quality management program. The programs elements are listed below with task descriptions under each program element, however the order of listing is not necessarily the order in which the tasks will be undertaken. Many of the tasks may be accomplished concurrently.

Collect Background Information

Task 1. Prepare a Basin Wide Drainage Map

Prior to identifying specific areas in which to concentrate demonstration project efforts, a clear understanding of the overall drainage system of the Rouge River must be obtained. Since the river basin covers parts of three counties, the existing information on sanitary and combined sewers and storm sewers and drains (enclosed pipes, open drains and natural watercourses) exists in a variety of differing forms and formats. This task will collect drainage network information from available sources and combine it into a single comprehensive geographical data base. This data base will be capable of generating maps of various areas at different levels of detail and scales.

Task 2. Define Drainage Subareas

Based on the basin wide drainage map, sewer maps from municipalities, topographical maps, aerial photographs, and field investigations, subareas tributary to the Rouge River will be delineated. These subareas will be considered for BMP's and control structures. Separate subarea maps will be produced.

Task 3. Inventory Land Use

A general land use map will be created based on SEMCOG and other existing data for identifying subareas of the Rouge River basin that may be chosen for testing BMP's and control structures. Detailed land use information will be obtained from SEMCOG and local governments of the subareas being considered for BMP's and control structures.

Task 4. Drainage Network Characterization

In order to define the manner in which the overall Rouge River drainage system operates a characterization of all components of the drainage system must be made. These components include natural water courses, tributary channels, improved open drains, enclosed storm drainage systems, municipal and highway storm drainage systems, combined sewerage systems, and those portions of sanitary sewerage systems with excessive rates of infiltration/inflow. For each component, physical characteristics need to be determined. These include size, slope, shape, inverts, and connectivity of conduits in the system as well as information on regulators and outfalls. This task will allow the necessary data on all portions of the system to be determined, recorded, and collected into a database consistent with other physical network data. This database will provide basic input to computer models which will ultimately describe the hydrologic and hydraulic interactions of the system, and provide a basis for water quality determinations. Work included in this task will combine research into records maintained by various public agencies.

Task 5. Estimate Dry Weather Flow and Wet Weather Flow

Dry and wet weather flows will be estimated for the major pipes and conduits of the drainage and sewerage networks of the subareas selected for testing BMP's and/or control structures. The dry weather flow will be estimated from sewer metering data (if available) and population. The 10 year peak flow will be estimated based on the Rational Formula or SCS Methods.

Task 6. Calculate the Velocity in the Pipes

The velocity in pipes and conduits of the drainage and sewerage networks of the subareas selected for testing BMP's and/or control structures will be calculated. The collection system should be designed to prevent sedimentation within the pipes. In reality this is often not the case. Thus, in large storms (or in periods of high infiltration/inflow) much of the load may be generated by sediment and sludge deposited within the collection systems rather than on the land surface. To evaluate the amount of sedimentation and scour one must first estimate the velocities within the collection system during dry weather. Pipes with slow dry weather flow velocities will be identified.

Task 7. Identify Industrial Dischargers

Industrial dischargers within the Rouge River basin will be identified. This information will be recorded in a geographical data base capable of being "overlaid" on drainage network and subarea maps. Each industrial facility located within the Rouge Basin will be identified through municipal pretreatment records, local land use and tax records, and state and federal hazardous material use inventories (SARA Title III reporting). A record of materials used in each industrial operation together with data on permitted discharges to the municipal sanitary sewers will be maintained in the database.

Conduct Field Work

Task 1. TV Sewers

Television cameras may be pulled through storm and sanitary sewers to check the condition of the sewers and to identify places of deposition in the sewers and locate unexpected connections, cross-connections, or incorrectly connected pipes.

Task 2. Conduct Dye Studies

Dye studies may be conduct to identify illegal connections to or cross-connections between storm or sanitary sewer systems or to field verify subarea collection system boundaries.

Task 3. Inspect Regulators

Many of the subareas sanitary sewer systems have regulator gates where the systems connect to the Lower or Middle Rouge Interceptors. All of the regulators will be inspected, and the settings and condition of the regulators will be noted.

Task 4. Inspect Outfalls

The structures where the stormwater or CSO meet the river or stream will be inspected from the sewer collection side of the outfall. The size, arrangement, and condition of outfall pipes or conduits, and backwater gates will be noted. Sedimentation in the outfalls also will be measured.

Task 5. Stream Survey

An aerial and a walking survey of the major tributaries of the Rouge River will be made. At minimum the survey will be conducted on the Main Branch, the Lower

Rouge, the Middle Rouge, the Bell Branch, and the Upper Rouge. Field crews will walk the stream to locate outfalls identified in previous tasks and to check for additional outfalls.

Design and Implement a Sampling Program

Six subareas will be chosen for testing of BMP's and control structures. The stormwater or CSO from these subareas will be metered and sampled before and after BMP's and control structures are implemented to judge the effectiveness of the BMP's and the control structures. Three of the subareas will have separate storm sewers, and the other three will have combined sewers or sanitary sewer systems with excessive rates of infiltration/inflow in wet weather. Several sampling and metering points will be selected for each subarea, and flow will always be measured at or near a sampling location. The sampling points will include the outfall from the subareas.

Task 1. Select Subareas

Six subareas will be selected with varying land use mixes and sewer collection characteristics for testing of BMP's and control structures. The land use, drainage maps, and industrial dischargers identified in the background information will be used to select the subareas.

Task 2. Select Metering and Sampling Locations

Once the subareas are selected, sampling and metering locations will be chosen. The purpose of the sampling and metering is to measure and characterize the stormwater and CSO discharges to surface waters from the subareas. Therefore the sampling and metering locations must include the outfalls of the subareas. Internal sampling and metering locations also may be selected. Once the sampling and metering locations are selected, they must be visited and the access must be verified. This visit often reveals that some manholes have been welded closed, that traffic control is required, or that there is inappropriate access to power or phone lines if permanent flow monitoring is implemented. The sampling and metering locations may have to adjusted to provide access.

It is important to inspect the locations to estimate the flow regime at the metering location, determine what type of flow measurements will be taken, the type of flowmeter to be used, the accuracy which can be expected in the flow regime, and whether one can expect turbulence, submergence, sedimentation or scour during the wet weather event. The sampling and metering locations may have to be adjusted to provide accurate flow measurements and adequate samples.

Task 3. Check Industrial/Commercial Establishments in the Subareas

Field surveys of industries and commercial establishments such as service stations and restaurants will be conducted for the subareas where BMP's and control structures will be tested. This information will be compared to the background information collected. This information also will be used to help identify sources of unexpected contaminants in stormwater and CSO, if found, during the sampling program.

Task 4. Select Laboratory Analyses to be Performed

Because sampling and analytical work is extremely expensive it is important to identify the pollutants expected and the analyses needed for design and testing of control structures or to judge the effectiveness of BMP's. Dryfall, rainfall, stormwater, and CSO samples may be analyzed for Total Suspended Solids (TSS), BOD, metals, phosphorous, and certain toxics. Particle size analysis of some stormwater and CSO samples may be helpful in designing settling basin control structures. Grab samples of stormwater and CSO may be analyzed for oil and grease and fecal coliform. The pollutants which are likely to come from a given land use or industry in the subarea should be anticipated. Suspended solids concentration in the stormwater and CSO may be used as an indicator of metals concentration in the stormwater and CSO.

Task 5. Install Rainfall Gages, Flow Meters, and Samplers

Recording rainfall gages will be installed in the subareas where BMP's and control structures will be tested. Flow meters and samplers will be installed at the locations previously determined.

Task 6. Conduct Dry Weather Sampling

Dry weather sampling will be conducted to establish baseline stormwater and sanitary sewage quality. In dry weather, there should be little discharge to surface waters from storm sewer outfalls. This discharge will be sampled continuously for several dry weather periods to determine groundwater baseflow quality and to check for unexpected or illegal connections. If higher than normal concentrations of pollutants in sanitary sewage are found or if toxics are found, then there may be illegal discharges to the sanitary sewer system.

Task 7. Investigate for Unexpected Connections

If the dry weather sampling indicates that there are cross-connections or illegal discharges to the storm or sanitary sewers, these discharges may be investigated through TV inspection of the sewers, dye studies, and surveying industrial/commercial establishments in the subarea.

Task 8. Conduct Wet Weather Sampling

Wet weather sampling of stormwater discharges, CSO, rainfall, and dryfall will be conducted for the subareas where BMP's and control structures will be tested. Several wet weather samples will be taken before and after the BMP's and control structures are in-place.

Wet weather sampling programs are difficult to plan and there are many things that must be thought out before committing manpower to the field. It is important to target the size of storms which are likely to occur during the period in which you intend to sample and adjust the sampler settings for these storms.

The samplers will automatically draw a sample which may be composited over time or composited in proportion to flow. Because it is impossible to accurately predict the amount of rainfall it is crucial that runoff estimates are made and sampler settings be properly adjusted or the samples will either overfill or underfill the sample container.

A meteorologist will be hired to predict the rainfall events which will produce enough runoff for sampling. The meteorologist alerts the sampling crew chief of an impending storm over the subareas, who is on call around the clock. The crew chief in turn notifies the remainder of the crew who mobilize to the subareas to turn on and adjust sample volume on the samplers, check the meters, open the rainfall sampling barrels, take rainfall measurements, and take grab samples. Sometimes the crew beats the rainfall to the subarea, other times the rainfall beats the crew to the area, and other times the rainfall never materializes.

It is important to evaluate holding times for the chemical analyses to be performed. Preservation of the samples with acid or ice may be required by EPA protocols. It is important to have an organized way to end or abort the sampling event and call in the crew. Beepers and mobile phones may be used.

The amount of sedimentation within the collection system be estimated and measured at points of deposition and scour identified in the velocity calculations, before and after each event. Samples of sediment may be collected and analyzed.

When the sampling program is initiated, the USGS should be contacted and requests made for copies of the actual strip charts for the Rouge River gages during the sampling period. Likewise, the National Weather Service should be contacted to arrange for the raw rainfall data from Metro Airport.

Task 9. Estimate Pollutant Loadings to the Rouge River

Spreadsheet tables for each rainfall event sampled for each subarea will be prepared showing pollutant loading calculations and dryfall day analyses.

Task 10. Treatability Studies

The stormwater and CSO samples will undergo treatability studies. The type of treatment that is currently acceptable to the Michigan DNR is sedimentation, skimming, and chlorination. It is important to see what portion of the pollutants in CSO and stormwater will settle in 15, 30 or 60 minutes or longer; what pollutants are associated with the solids which are settled; what pollutants are soluble and will not settle; and what effects does chlorination have on both the soluble fraction and the solids fraction with regard to toxicity.

Task 11. Scour and Deposition Study

Scour and deposition estimates for each rainfall event will be summarized on spreadsheet tables. This data will indicate how sediments are transported in the collection systems. If a first flush is observed in the sampling data, then it may be attributed to scouring of deposits made in dry weather.

Hydrologic and Hydraulic Modeling

Task 1. Hydraulic Modeling of the Lower and Middle Rouge Interceptor Systems

The EXTRAN block of the U.S. EPA Storm Water Management Model (SWMM) will be used to model the Interceptor system from the connections to Detroit's system to the most upstream connection. This model will be used to evaluate treatment capacities from each district and evaluate regulator gate settings. Inflows to the interceptors will be taken from sewer billing records, and I/I and SSES studies for communities along the interceptors. Some additional temporary metering of interceptor and tributary flows may be required and undertaken.

Task 2. Hydrologic and Hydraulic Modeling of Subarea Collection Systems

Base upon the information collected above, a computer model of the drainage system will be developed for each subarea where BMP's and control structures will be tested. The models will allow simulation of the water quantity relationships of various portions of the system in response to rainfall on the tributary areas. It is anticipated that the basis for the modeling effort will be SWMM, in particular the RUNOFF and EXTRAN blocks. The flow metering data from the wet weather sampling will be used to calibrate and verify the models.

Task 3. Hydraulic Modeling of the Rouge River System

Similar to the previous task, a detailed hydraulic model of the natural river network will be developed. This model will consider all components of the Rouge River system including the impoundments which have been constructed. It will provide the basis for determining the hydraulic response of the river to rainfall on tributary areas. USGS river gage information will be used to calibrate and verify the model. Additional flow metering of the River and tributaries may also be required to calibrate the model. U.S. EPA models QUAL-II and RUNQUAL may be used to simulate the flow in the Rouge River.

Task 4. Water Quality Modeling of the Rouge River System

Based on the pollutant loadings to the Rouge River from the subareas sampled, the overall loadings to the Rouge River will be estimated. Water quality models will be used to evaluate the impact to the Rouge River of stormwater and CSO discharges. Water quality models also will be used to evaluate the effect of BMP's and control structures on Rouge River quality. Sampling of the Rouge River quality will be required in dry and wet weather to calibrate and verify the models. U.S. EPA models QUAL-II and RUNQUAL may be used to simulate water quality in the Rouge River.

Implement and Test BMP's

Task 1. Point Source BMP's

Point source BMP's which may be implemented and tested in some subareas include: new detention basins and modifications to existing detention basins; parking lot drainage restrictions; and improved enforcement of regulations pertaining to industrial pretreatment systems, outside storage of materials and erosion control.

Task 2. Non-Point Source BMP's

Non-point source BMP's which may be implemented and tested in some subareas include street sweeping and household hazardous waste collection programs.

Task 3. Analyze Results

The effectiveness of the BMP's will be evaluated based on reduction in pollutant loadings calculated on the pollutant loading spreadsheets from the "before" and "after" sampling data.

Design, Build, and Test Control Structures

Task 1. Select Subareas and Sites

Alternate locations in the six subareas selected for wet weather sampling will be considered for control structures (e.g. detention basins, settling tanks, etc.) based on field surveys, soil surveys, structural requirements, hydraulic constraints, instrumentation and mechanical control requirements, and cost. Design criteria for the control structures may be taken from the treatability studies done with the wet weather sampling. The volume and treatment rate required may be determined from the EXTRAN modeling of the Lower and Middle Rouge Interceptor systems. A preliminary design report will be prepared including design criteria, alternative locations considered, expected benefits, preliminary sketches, costs and recommended sites.

Task 2. Design Control Structures

Following preliminary design approval by the MDNR and EPA, plans and specifications for construction will be prepared for the control structures. These designs will incorporate features that would allow measurement of flows and collection of samples in order to characterize quantity and quality of both influent flows and treated outflows.

Task 3. Build Structures

Property will be acquired and the control structures will be built. Specific attention will be paid to those aspects of the construction process that will assure transferability of the results to similar projects both within the Rouge River basin and throughout similar urban river systems.

Task 4. Operate Structures and Collect Test Data

After completion of construction, the structures will be operated and tested for several rainfall events. The inflows and outflows to and from the control structures will be metered and sampled during these events. Reductions in outfall volume and pollutant loadings will be used to calculate pollutant removal efficiencies. These actual removal efficiencies will be compared with the expected removal efficiencies and will be used to evaluate the effectiveness of the control structures.

Public Participation, Reporting, Institutional Arrangements

Task 1. Public Participation

Public participation will be an important element of this study. Public awareness, especially of the BMP's, will be encouraged through presentations to school groups, service organizations, and local governments. Public notice and hearings will be required for construction of the control structures. An advisory board of local citizens will be formed to monitor the progress of the project.

Task 2. Reporting

For each of the preceding program elements a working paper will be generated. The final report will be a compilation of these working papers. Model input and output files, base maps, subarea maps, and the data base will be included in the reports. Emphasis will be placed on presentation graphics.

Task 3. Institutional Arrangements

Institutional arrangements between Wayne County and the local communities, and between Wayne County and the Detroit Water & Sewerage Department will be reviewed. Mutually beneficial changes to these arrangements, if identified will be recommended.

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WAYNE COUNTY DEPARTMENT OF PUBLIC WORKS
BASIN WIDE WATER QUALITY MANAGEMENT PROGRAM

COST ESTIMATE

	PERSON WEEKS	LABOR COST	DIRECT COSTS	TOTAL COST
BACKGROUND INFORMATION				
1 BASIN WIDE DRAINAGE MAP	50	160,000	15,000	175,000
2 DEFINE DRAINAGE SUBAREAS	20	64,000	10,000	74,000
3 INVENTORY LAND USE	50	160,000	15,000	175,000
4 DRAINAGE NETWORK CHARACTERIZATION	60	192,000	35,000	227,000
5 ESTIMATE DRY & WET WEATHER FLOWS	35	112,000	10,000	122,000
6 DETERMINE FLOW VELOCITIES	40	128,000	20,000	148,000
7 IDENTIFY INDUSTRIAL DISCHARGERS	50	160,000	45,000	205,000
CONDUCT FIELD WORK				
1 TV INSPECTION OF STORM SEWERS	60	192,000	800,000	992,000
2 CONDUCT DYE STUDIES	40	128,000	150,000	278,000
3 INSPECT REGULATORS	40	128,000	25,000	153,000
4 INSPECT OUTFALLS	60	192,000	25,000	217,000
5 STREAM SURVEY	80	256,000	125,000	381,000
SAMPLING PROGRAM				
1 SELECT SUBAREAS	25	80,000	10,000	90,000
2 METERING & SAMPLING LOCATIONS	30	96,000	10,000	106,000
3 INDUSTRIAL / COMMERCIAL FACILITIES	40	128,000	20,000	148,000
4 IDENTIFY LABORATORY ANALYSIS	25	80,000	10,000	90,000
5 INSTALL GAGES, METERS AND SAMPLERS	120	384,000	1,200,000	1,584,000
6 CONDUCT DRY WEATHER SAMPLING	100	320,000	75,000	395,000
7 INVESTIGATE FOR UNEXPECTED CONNECTION	80	256,000	50,000	306,000
8 CONDUCT WET WEATHER SAMPLING	160	512,000	200,000	712,000
9 ESTIMATE POLLUTANT LOADINGS	80	256,000	10,000	266,000
10 TREADABILITY STUDIES	65	208,000	20,000	228,000
11 SCOUR AND DISPOSITION SYUDY	60	192,000	40,000	232,000

HYDROLOGIC AND HYDRAULIC MODELING				
1 HYDRAULIC MODELING OF INTERCEPTORS	120	384,000	20,000	404,000
2 MODELING OF SUBAREA COLLECTION SYSTEM	200	640,000	40,000	680,000
3 HYDRAULIC MODELING OF ROUGE RIVER	100	320,000	40,000	360,000
4 WATER QUALITY MODELING OF ROUGE RIVER	120	384,000	50,000	434,000
IMPLEMEMT AND TEST BMP's				
1 POINT SOURCE PROJECT	300	960,000	1,250,000	2,210,000
2 NON-POINT PROJECT	250	800,000	750,000	1,550,000
3 ANALYZE RESULTS	200	640,000	100,000	740,000
DESIGN, BUILD AND TEST FACILITIES				
1 SELECT SUBAREAS AND SITES	75	240,000	40,000	280,000
2 DESIGN CONTROL FACILITIES	200	640,000	40,000	660,000
3 CONSTRUCT FACILITIES	120	384,000	30,000,000	30,384,000
4 OPPERATE AND TEST FACILITIES	60	192,000	20,000	212,000
PUBLIC INFORMATION				
1 PUBLIC INFORMATION	80	256,000	150,000	406,000
2 REPORTING	40	128,000	50,000	178,000
3 INSTITUTIONAL ARRANGEMENTS	40	128,000	50,000	178,000
TOTAL PROGRAM COST ESTIMATE	3275	10,480,000	35,520,000	46,000,000

Attachment
"A"

ROUGE RIVER NONPOINT SOURCE POLLUTION CONTROL PROGRAM

ANNUAL REPORT TO THE WAYNE COUNTY DEPARTMENT OF PUBLIC WORKS

December 1, 1988 to November 30, 1989

ABSTRACT

The project is designed to protect the public health, environment and improve water quality by decreasing the release of chemicals and sewage to Rouge River from commercial and industrial facilities. Plumbing fixtures in selected facilities were dye tested to determine if they were properly connected to the sanitary sewers. Two hundred and fifteen facilities were tested and twenty five (11.5%) were found to have improper connections. Most improper connections were the result of incorrect floor drain plumbing sometimes associated with renovation of the structures. Two newly constructed facilities, a motel and a muffler shop, were found to have their entire sanitary systems tied into the storm sewers. Pre and post sampling of one drain service area outfall found a reduction in pollutants ranging from 12 to 89%. The program was successful in reducing the amount of pollutants that reach the Rouge River.

INTRODUCTION

The purpose of this project is to protect the public health, environment and improve water quality by reducing the potential for the release of toxic chemicals and sewage to the Rouge River from industrial and commercial facilities.

The Rouge River Nonpoint Source Pollution Control Program was initiated in 1987 with State grant funds. For the County Fiscal Year 1988-89, the Wayne County Division of Public Works (WCDPW) provided funds to supplement the State grants.

METHODOLOGY

The work was limited to the Rouge River basin within Wayne County. The Rouge basin is a 467 square mile fan shaped basin. Approximately 60% (276 square miles) of the basin is in Wayne County. The river flows in a generally southeasterly direction through four major branches from glacial moraines in the northwest, across sand and clay flats to the Detroit River.

Seven (7) drainage service areas (dsa) were investigated during the 12 months ending November 30, 1989. The dsa is a defined runoff area serviced by an individual storm sewer. Figure 1 is a map of the dsa's. Table 1 summarizes the physical information on the dsa's.

FIGURE 1

ROUGE RIVER BASIN WITHIN WAYNE COUNTY AND THE INVESTIGATED DSA'S

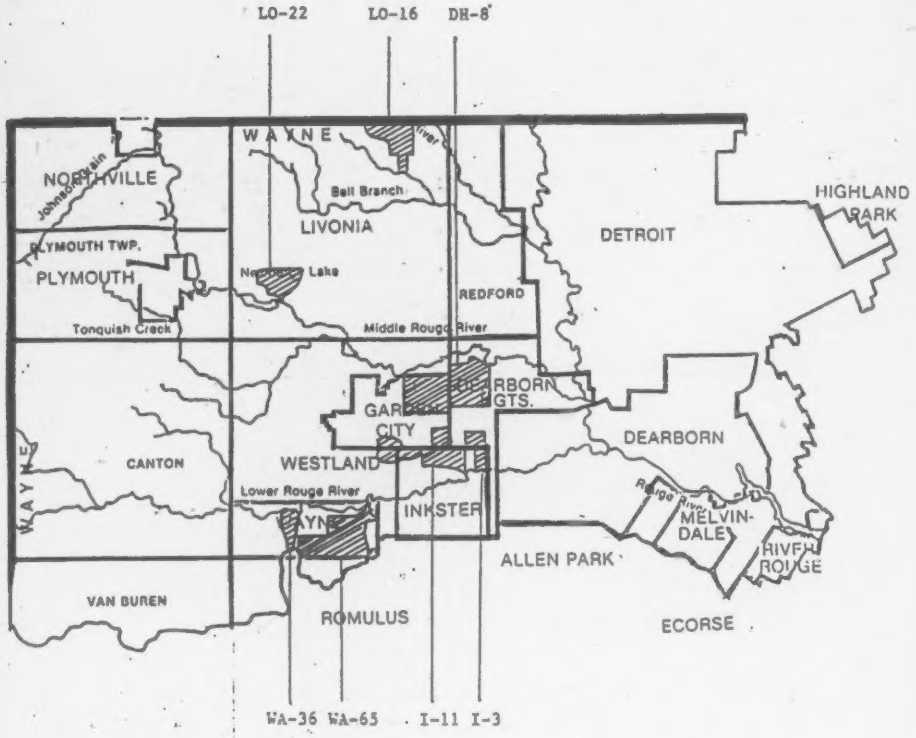
LO-22
LO-16
DH-8
WAYNE
NORTHVILLE
Johnson Drain
Bell Branch
LIVONIA
PLYMOUTH TWP.
PLYMOUTH
Newburgh Lake
REDFORD
DETROIT
HIGHLAND PARK
Tonquish Creek
Middle Rouge River
DEARBORN HGTS.
GARDEN CITY
WESTLAND
CANTON
DEARBORN
WAYNE
Lower Rouge River
INKSTER
Rouge River
MELVINDALE
RIVER ROUGE
ALLEN PARK
VAN BUREN
ROMULUS
ECORSE
WA-36
WA-65
I-11
I-3

TABLE 1

SUMMARY OF PHYSICAL INFORMATION ON THE INVESTIGATED DSA's

December 1, 1988 - November 30, 1989

NUMBER	OUTFALL PIPE DIAMETER	LAND USE	PRIORITY BUSINESS ESTABLISHMENTS*	ESTIMATED AREA (ACRES)
I-11	144"	Res/Commercial	22	20
DH-8	108"	" "	54	1520
WA-36	96"	" "	22	98
WA-65	108"	" "	39	1665
I-3	90"	Residential only		675
LD-16	54"	Res/Commercial	142	723
LD-22	108"	" "	64	608
		Totals	343	5309

* PRIORITY BUSINESS ESTABLISHMENTS

. Priority I:	Automobile Related Businesses/Facilities and Heavy Manufacturing.
. Priority II:	Printers, Dry Cleaners/Laundries, Photo Processors, Utilities, Paint Stores, Water Conditioners, Chemical Laboratories, Construction Companies and Medium-Light Manufacturing.
. Non-Priority:	Institutional Facilities, Private Service Agencies, Retail Establishments, and Schools.

Facilities were surveyed for hazardous materials storage practices and dye tested to assure that the plumbing fixtures were tied into the sanitary sewer. The outfall for the dsa was sampled prior to investigative work within the dsa to obtain pollutant loadings to the Rouge River. After all corrective measures were confirmed within a dsa, the outfall was resampled to again obtain pollutant loadings. Thus it was possible to estimate the reduction in pollutants from a given dsa. This was possible on only the Perrin Drain during the project year.

FINDINGS

Two hundred and fifteen (215) facilities were inspected this project year. Twenty-five (25) facilities were found to have improper disposal of their plumbing fixtures. Therefore, 11.5% of the facilities have been found to be misconnected. Nine of the facilities inspected were outside the priority dsa. They were inspected because of reliable information and/or complaints. In one case our department assisted the U.S. EPA and MDNR in an investigation.

The most common problem found with the misconnected facilities were floor drains improperly connected. If a facility was renovated or altered after original construction, the newly added plumbing fixtures may have been misconnected. However in two cases, an automotive related service facility and a newly constructed 54 room hotel (a non-priority facility), the entire sanitary systems were connected to the storm sewers. Both of the facilities were quickly repaired by the city. See the appendix for summary of all the misconnected facilities.

All corrective measures were completed and confirmed on the Perrin Drain dsa during this twelve month period. Therefore, it is possible to compare the pre and post outfall sampling data. Table 2 summarizes the data. It shows that in a 24 hours period the amount of pollutants discharged was reduced from 12 to 89%.

As projected earlier, the investigation of the dsa identified as I-3 providing drainage for a residential area was not undertaken. Grab samples taken during the 1987 Lower II Rouge Study found chromium and oil and grease. Attempts to sample the main branches of the storm sewer, to isolate the polluting branch, were not possible due to lack of flow.

TABLE 2

MASS LOADINGS FOR PERRIN DRAIN

PARAMETER	QUANTITY DISCHARGED IN 24 HOURS		DIFFERENCE IN THE QUANTITY DISCHARGED	PERCENT OF CHANGE
	NOV.'88	JULY '89		
Cadium	DL	DL	-	-
Chromium	DL	DL	-	-
Lead	DL	DL	-	-
Nickel	DL	DL	-	-
Zinc	.25	.19	- .06	24
TOC	184.0	20.0	- 164.0	89
O & G	25.6	22.4	- 3.2	12
Ammonia	3.0	1.24	- 1.8	58
Tox - Cl	DL	0.09	+ .86	-
Tox - Br	DL	DL	-	-
Tox - I	DL	DL	-	-
FC	3.4×10^{10}	4.2×10^{10}	$- 2.98 \times 10^{10}$	88
FS	9.1×10^{10}	2.3×10^{10}	$- 6.8 \times 10^{10}$	75

TOC - Total Organic Carbon
O & G - Oil and Grease
FC - Fecal Coliforms
FS - Fecal Streptococci
DL - Below Detection Limit

TOX - Total Halogenated Organics
Cl - Chlorine
Br - Bromide
I - Iodine

- Decrease

+ Increase

Units: Chemicals - pounds/24 hours
FC, FS - number of organisms/24 hours

DCT:lr
1/24/90

CONCLUSIONS

A significant number of facilities inspected (11.5%) were found to have improper connections to the storm sewers.

Reducing the pollutant loadings to the Rouge River by 12 to 89% in one dsa, indicates that the program had a significant impact.

RECOMMENDATIONS

Since the newly constructed motel was found to be misconnected, it is recommended that multiple dwelling units be included in the list of priority business establishments for Project Year 1990 and subsequent years' programs.

APPENDIX A

Outfall Sampling Procedure

Three samples were collected on three consecutive days (during dry flow) with measurements that would allow an estimate of discharge prior to investigating a dsa. After investigation and all corrective measures were made in the dsa, the sampling program was repeated. Determining the mass loadings before and after allows an estimate in the pollutant reduction.

Mass loadings were made by utilizing the geometric mean of the three samples and discharge. The appropriate conversion factors were used to determine the mass loadings in the number of pounds per 24 hours. The discharge was estimated using the Manning Equation.

Geometric Mean = $\sqrt[n]{X_1 \times X_2 \ldots X_n}$

Manning Equation

$$Q = \frac{1.49\ AR^{2/3}\ S^{1/2}}{n}$$

Q = Discharge, ft^3/sec.

n = Manning roughness coefficient (.011 for Perrin Drain outfall)

A = Cross sectional area of flow.

R = Hydraulic radius.

S = Slope of the pipe. (.001 for the Perrin Drain)

Q in l/hr = (ft^3/sec) (28.32 l/ft^3) (3600 sec/hr)

Mass loading:

Pounds/24 hrs = (mg/l)(Flow in l/hr)(24 hrs)(2.2046×10^{-6} lbs/mg)

APPENDIX B

SUMMARY OF IMPROPERLY CONNECTED FACILITIES

FACILITY	NATURE OF PROBLEMS
RR 3 DH8 - Dearborn Heights	
* Molded Material 27189 Warren Road	Catch Basins and Sink (3)
* Town & Country Cleaners 26580 Ford Road	Floor Drains
Westland - Special	
* Feister Oil & RV Center 3401 Ford Road	Floor Drains (3)
* Westland Park N. of Michigan Ave., E. of Venoy Road	Sanitary Spillage in the Park
I-11 Inkster	
* Carron Engineering 27100 Avondale	Floor Drains in Small Boiler Room (2)
Romulus - Special: Further investigations being handled by DNR/EPA	
* Hayball Trucking 34170 Goddard Road	Floor Drain (1)
* Gruber Truck Repair 34236 Goddard Road	Floor Drain (1)
* Mr. Muffler 32216 Michigan Avenue	Toilets (2), Sinks (2) Garage Floor Drains (2)
WA 65 - Wayne	
* Red Apple Restaurant/Motel 32711 Michigan Avenue	53 Rooms w/Toilet; sink and tub along w/washing machines (laundry room) (2)

* Air Compressor Sales 3441 Filbert	Catch Basins (5), and Sinks (2)
* Burroughs (Vacant) 3737 Venoy	Catch Basins (2)

WA 37.0 - Wayne

* Wayne Firehouse Station 3300 Wayne Road	Large Catch (3) Small Drains (12)

WA 36 - Wayne

* Unistrut (Main) 4205 Elizabeth	Truck Bay Catch Basin
* 3M/Kimco 3720 Venoy Road	Combined Sewer

Plymouth - Special

* Smith Elementary School 1298 McKinley	Sump Pump in Boiler Room

Plymouth Township - Special

* Bird Elementary School 220 Sheldon Road	Sump Pump in Boiler Room

D#1 - Livonia - Special

* Ryan Transport Group 12300 Farmington Road	Entire Garage Floor Drains

LD 16 - Livonia

* Farmington Cabinet 30795 Eight Mile Road	Catch Basin
* TMC Progressive Lift 31411 Eight Mile	Garage Catch Basin
* E & M Underground Construction 30845 Eight Mile Road	Small Basement Floor Drain
* Williams Hoisting Equipment 31145 Eight Mile Road	Catch Basin

LD 22 - Livonia

* Saker One 36855 Schoolcraft	Dry Wells (2)

Livonia - Special (Near LD 29) - Newburg Lake

* Lakepointe Yacht Club 37604 Ann Arbor Road	Bar Sink, Kitchen Sinks (2) and Basement Utility Sinks

Redford Township - S.A.D.D.

* K & Y Screw Machine	Catch Basins (2) Sump Pump Basin (1)

Attachment "B"

1826

HURON RIVER POLLUTION ABATEMENT PROGRAM

Washtenaw County Statutory Drainage Board

James E. Murray, Chair

July 1987

Project Coordinators

Richard Badics, R.S.
Valerie F. Tucker, C.E.

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OVERVIEW

The impact of non-point pollution on this area's water quality is well documented. From 1982 through 1986, the Washtenaw County Drain Commissioner and Health Department took an active role in the storm water management of Ann Arbor and Ypsilanti cities. Through locally funded projects, 94 improper storm drain connections and 8 sanitary storm sewer cross-connections were discovered and later corrected. However, local water quality problems still exist.

On January 1, 1987, James Murray, Washtenaw County Drain Commissioner, through the Michigan Drain Code, established the Huron River Pollution Abatement District. The goal of this five year program is to limit non-point pollution's impact on the District's water quality. This will be accomplished by sampling the District's storm drains and river stations, surveying commercial establishments, dye-testing these establishments and suspect residential areas, and educating business, industry, and local citizens on what they can do to prevent this type of pollution.

INTRODUCTION

Urban storm run-off is rain and snow melt collected in municipal storm sewers after running over the ground on an impervious surface. The use and type of surface affects the amount of run-off. Contaminants of salt, oil, garbage, animal feces, fertilizer, pesticides, sediments, human excreta, and industrial waste are common in storm water run-off in varying concentrations. They contribute physical and chemical substances as well as large populations of biological organisms such as bacteria and viruses to storm water. These contaminants go directly to our surface waters, lakes and streams without treatment. The highest concentration of these contaminants are contained in "first flush" or a major storm's run-off occurring after a dry period. This typically has the greatest impact on water quality.

In 1972, the United States Congress passed the Clean Water Act which set 1985 as the target for eliminating pollution of the nation's waterways and mandated governmental agencies across the nation to prepare plans to accomplish this. The United States Environmental Protection Agency (EPA) in reviewing plans from over 150 governmental agencies discovered that greater than 50% of the nation's river basins were adversely affected by urban run-off. The EPA responded to this problem by forming the National Urban Run-Off Program (NURP). NURP's nationwide study showed that the majority of bacterial contamination of surface water originates from sanitary and storm sewer cross-connections and their improper sanitary waste connections to storm sewers.

Locally, the influence of the urban storm water and its impact on the Huron River, Ford Lake, and Belleville Lake further downstream has been well documented. In 1966, the University of Michigan recommended that an intensive survey of the storm sewers discharging into the Huron River be made.[1] They felt that illegal cross connections into the storm drains had a significant impact on the water quality of the Huron River especially during periods of low flow, and thus warranted further study.

The Canale Report[2] in 1972 computed through mathematical modeling that Ford Lake would not pass water quality standards from storm sewer contaminants alone. A study funded by the Michigan State Legislature and conducted by the Department of Natural Resources with Wayne and Washtenaw County Health Departments during the mid-1970's focused on 80 storm drains that outlet into the Ford and Belleville Lake system and included 35 lake water quality stations.[3] Sampling occurred during three rainfall events in addition to the substantial sampling during dry weather conditions. The data collected was used to develop a mathematical model that could be used to predict the dynamics of fecal coliform bacteria in the lakes. They concluded that the major contributor during dry weather conditions of solids, Biological Oxygen Demand (BOD), nutrients, and fecal coliform bacteria to Ford Lake was the Huron River.

This encouraged the Huron River Watershed Council to hire Roger Copp to conduct a study of the storm drains in Ypsilanti during 1981.[4] The Copp Report identified that high fecal coliform levels from storm drains in Ypsilanti have a detrimental impact on the river's water quality during rainfall events. The report recommended that the Washtenaw County Health Department establish priorities for locating sources of fecal coliform bacteria in Ypsilanti storm drains, Ford Lake, and the Huron River upstream of Ford Lake to reduce the amount of bacterial pollution.

In Ann Arbor, the students of the University of Michigan School of Public Health conducted surveys of the Huron River for several years as part of their summer course work. Samples of the Allen Creek storm drain outfall have been analyzed during these surveys. In 1976, grab samples were taken during dry weather conditions and showed that the concentrations of most parameters monitored were low.[5]

The data obtained during rain events in 1977 demonstrated a large increase of suspended solids as related to data obtained during dry weather.[6] This particular study concluded that the Allen Creek Drain had the highest level of suspended and dissolved solids of the city's five storm drains surveyed.

A second study conducted in 1979[7] found the Allen Creek storm drain outlet contributing solids, nitrates and metals during a snow melt in late winter and during a summer storm. The study further documented that the fecal coliform levels in the storm drains exceeded the state water quality standards immediately after storm events. The investigators concluded that the urban storm drains in Ann Arbor have a major impact on the water quality of Geddes Pond downstream.

In 1981, local residents living by Paint Creek in Ypsilanti Township questioned its water quality. Preliminary sampling showed fecal coliform levels of over 200,000 colonies per 100 milliliters. To address this problem, a task force of concerned citizens, the Washtenaw County Drain Commissioner, representatives of the Washtenaw County Health Department, the City of Ypsilanti, Ypsilanti Community Utilities Authority, and Ypsilanti Township was formed. After nine months, they found that there was no management plan designed to abate this type of problem. In 1982, the task force concluded that:

1. The storm drain contamination problem was severe.
2. That the storm drain sewer contamination problem was wide-spread.
3. That there were many similarities between Paint Creek and the storm sewer water quality problems in the cities of Ann Arbor and Ypsilanti.
4. That this type of problem could be abated only with a unified effort.

In June of 1982, agreements were signed between the City of Ann Arbor, City of Ypsilanti, and the Washtenaw County Board of Commissioners to jointly fund a Water Quality Program whose task was to focus on the efforts of the community assessing and eliminating illicit tap-ins and cross-connections to the storm sewer systems in Ypsilanti and Ann Arbor.

From their conception in 1982, the Ypsilanti and Ann Arbor water quality projects were successful in eliminating over 90 illicit storm drain connections and 8 sanitary and storm sewer cross-connections[8]. This annually has prevented thousands of gallons of contaminated water from entering the Huron River. The elimination of these storm drain connections has resulted in a measurable improvement of the water quality of the storm sewers and the Huron River.

From 1982 through 1986, a total of 660 businesses, homes, and other buildings were dye-tested by the Ann Arbor and Ypsilanti water quality projects. Ninety-four (94) were found to have improper storm drain connections (14%) (See Appendix A). Of the 94 storm drain connections discovered, 89 (95%) were corrected as of December 31, 1986. In addition, 8 of the 8 (100%) storm drain and sanitary sewer cross-connections have been corrected.

In Allen Creek, of the 37 chemical parameters which were monitored from 1982-86, 32 (86%) have shown a decrease in the chemical concentrations, while only 2 (5%) have shown an increase (See Appendix B). Appendix B also compares the 1986 Allen Creek chemical concentration averages versus the 1986 control station (above Argo Dam) averages including percent difference. Argo Dam was utilized as a control station to establish a baseline concentration of the 37 parameters common to the Huron River prior to reaching a highly urbanized area. While the water quality at the Allen Creek outfall has demonstrated a marked improvement since 1984, the Allen Creek levels were greater than the control station 97% of the time. This water quality gap can be expected to decrease when the remaining Priority II businesses are completed and all corrections are done. This was after 56 (92%) of the improper storm drain connections within the Allen Creek drainage basis were removed. In the Owen drainage district, after removal of 8 storm drain connections and 4 sanitary storm sewer cross-connections, a drop in the fecal coliform levels from the 1981 study of Roger Copp was 95% and 98% in dry and wet weather sampling, respectively.

OBJECTIVES

The objective of Huron River Pollution Abatement Project is to locate and eliminate sources of non-point pollution to the Huron River and Willow Creek which flow through the Abatement District. This is accomplished by sampling the storm sewers and the river, surveying buildings, dye-testing these establishments and suspect residential areas, and educating industry, business and the general public on proper procedures they can utilize to eliminate this type of pollution.

DESCRIPTION

The Huron River Pollution Abatement District was established by the Washtenaw County Drain Board through Washtenaw County Drain Commissioner, James Murray. This project, which is scheduled to run from January 1, 1987 through 1991 for a total of 5 years, has been given the charge to locate and eliminate sources of non-point pollution through the drainage district to prevent surface water contamination. Included within the Huron River Pollution Abatement District are the cities of Ypsilanti and Ann Arbor, as well as the townships of Ann Arbor, Pittsfield, Scio, Superior, and Ypsilanti (see Appendix C). The total acreage involved within the District is 32,633 of which 17% is commercial or industrial use.

Of the 40,180 parcels within the District, 3,969 are either commercial, industrial, or tax exempt (see Appendix C). The balance of the parcels are residential.

FUNDING

Funding for the project is obtained from special assessments levied by the Drainage Board onto the local municipalities (and in turn to individual property owners).

In 1986, special assessments totaling $324,588.44 were levied on 15,309 parcels included in the above municipalities plus the City of Ann Arbor at large. They were levied as follows:

— $ 4.50 per agricultural or residential parcel
— 10.00 per vacant business or commercial parcel
— 40.00 per business parcel < 2 acres
— 75.00 per business parcel > 2 but < 5 acres
— 150.00 per business parcel > 5 acres
— 15.00 per vacant industrial parcel
— 50.00 per industrial parcel < 2 acres
— 100.00 per industrial parcel > 2 but < 5 acres
— 200.00 per industrial parcel > 5 acres
$178,900.94 for the City of Ann Arbor at large (55%)

The special assessments are to be collected once a year over a period of five years and charged to the winter property tax bills. The first assessment appeared on the December 1, 1986 property tax statement, and the final assessment will be charged on the December 1, 1990 statement. The Statutory Drain Board expects to collect over $1.7 million through special assessments and temporary investments for this project.

BUDGET

The following is the Abatement District's budget which does not include start up cost of $23,328 incurred in 1986:

	1987	1988	1989	1990	1991	Total
Personnel	$163,000.00	267,000.00	291,000.00	312,000.00	219,000.00	1,252,000.00
Cons. Serv.	10,000.00	5,000.00	2,500.00	2,500.00	5,000.00	25,000.00
Lab. Serv.	70,000.00	23,000.00	10,000.00	10,000.00	120,000.00	233,000.00
Administrative	3,524.96	3,150.00	3,150.00	3,150.00	3,150.00	16,124.96
Computer & Supp.	5,000.00	150.00	150.00	150.00	100.00	5,550.00
Testing Equip.	13,329.17					13,329.17
Testing Supp.	568.80	1,200.00	1,250.00	1,250.00	625.00	4,868.80
Field Eq./Supp.	15,259.78	27,625.00	27,210.00	27,110.00	13,030.00	110,234.78
Employ. Trng.		500.00	500.00			1,000.00
TOTALS	$280,682.71	327,625.00	335,735.00	356,160.00	360,905.00	1,661,107.71

The funding for the Huron River Pollution Abatement Project is through special assessments levied on parcels within the Abatement District. The money generated is utilized to cover all costs of the program including personnel, consulting fees, lab services, administration, equipment purchases, etc.

METHODS

The Huron River Pollution Abatement District utilizes four methods for enhancing the District's water quality. They are sampling, survey/dye-test, and education.

Sampling:

Permanent sampling stations have been established at the outfall of the three largest storm drain systems within the Abatement District's jurisdiction, the Allen Creek in Ann Arbor; the Owen Drain in Ypsilanti; and the Beyer Drain in Ypsilanti Township. These stations have a 24-hour composite sampler and flow meter. Weekly composite samples will be taken at the three stations for primary analysis (see Appendix D). Seventy-eight (78) samples every other week will include the secondary parameter list. The sample results from the previous studies in Ypsilanti and Ann Arbor were reviewed with our consultant, Environmental Control Technology Corporation (ENCOTEC). The parameters were selected because they cover a wide range of water quality indicators which are impacting on the Huron River system.

A second type of sampling will be Huron River grab samples. Samples will be taken from four river stations every other week for 26 weeks and will be analyzed for the primary and secondary parameter groups and include the dissolved oxygen level. We will be able to calculate the water quality index at these four river sites.

Sampling will include storm drain grab samples. Grab samples will be used for complaint investigations and storm sewer/sanitary surveys. All storm drain manholes within the District will be checked for improper connections and for water quality problems. Samples will be collected from all suspect storm sewer structures for locating industrial discharges, and isolating residential neighborhoods that have sanitary discharges into the storm sewer.

Soil samples will be collected from industrial drainfields. It is expected that businesses which discharge chemicals into sanitary sewers, discharged to their septic fields before municipal sewer was available.

Survey/Dye-Test:

All commercial, industrial, and tax exempt businesses and buildings within the District's boundaries will be surveyed. The survey includes:

1. A general list of on-site hazardous substances.
2. Chemical storage practices of the establishment.
3. Hazardous material handling and disposal practices.
4. A survey of the building's plumbing scheme.
5. Check of the Material Safety Data Sheets.
6. Recording all underground and above ground storage tanks including: capacity, age and method of tracking the current inventory.

7. Checking the establishment for issued groundwater discharge, National Pollutant Discharge Elimination System (NPDES), permits if applicable. In certain instances, referring to the Department of Natural Resources (DNR) if a permit is required.
8. A check of the company's small quantity generator number, if applicable.
9. A check of the Pollution Incident Prevention Plan (PIPP) under Act 245, if applicable.

After all floor drains, waterclosets, etc., are located during the survey, a dye-test will be made of all plumbing fixtures and floor drains. All 3,969 non-residential parcels within the Abatement District's jurisdiction will be dye-tested during the five year program. Any business having improper storm sewer connections are issued a letter explaining that they are in violation of the Local and State Plumbing Code, and are given alternatives to correct. They are turned over to the local government plumbing inspector for enforcement if corrections are not made. Any storm drain connections that require permits from the Department of Natural Resources are handled through the DNR. Follow-up with the local governmental agency or DNR is continued until the situation is resolved.

Education:

Education is a major component of the Huron River Abatement Project. For example, if a gas station is properly connected to the sanitary sewer throughout the building and their personnel poured the used motor oil they collect down the catch basin in front of the service station, no improvement of water quality is obtained. The sanitarian conducting the surveys will inform the manager and personnel of the proper way of handling and disposing.

The Huron River Pollution Abatement District is also involved with the local school system, colleges, and citizens groups to develop best management practices for handling and disposal of hazardous materials, and make presentations at various public gatherings to inform the public of things they can do to prevent water pollution and what number to call if they discover a water pollution source.

Other educational tools used are the local press, radio, publishing articles in professional magazines, and making presentations to governmental agencies.

DISCUSSION

Sampling:

The sampling program is essential to the abatement project's objectives of eliminating non-point pollution in two ways:

1. The sampling results can be used to locate "hot spots" and help define areas that need to be dye-tested that are not scheduled to be completed in the residential areas. This will help prioritize the residential dye-testing and confine it to areas that are probable or known contamination sources.

2. Sampling is important so that we will be able to quantify the water quality enhancement achieved by eliminating non-point pollution sources in this manner.

In the Ann Arbor and Ypsilanti water quality projects from 1982-87, a total of 3,344 bacterial and 2,647 chemical samples were taken (see Appendix A). The water quality projects in Ypsilanti and Ann Arbor were on a year-by-year locally funded grant. This sampling data was crucial in locating "hot spots" of contamination so that the most critical areas were dye-tested. The sample results were also able to demonstrate a water quality enhancement that was achieved after these non-point pollution sources were removed. The weak link in this process, however, was the inability to be able to quantify the decrease in loadings of these materials after improper storm drain connections were removed from the system.

One of the goals of the Huron River Pollution Abatement Project is to be able to quantify the loading differences before and after conducting the survey, dye-testing, and removal of improper connections to a particular storm drain branch. The three largest storm drains within the project's jurisdiction, Allen Creek, Beyer Drain, and the Owen Drain, have permanent sample stations constructed on-site. These sample stations are equipped with an automatic composite sampler which is tied to bubbler style flow meter. We will take the data that we receive from the sample results at these stations and quantify their loadings. ENCOTEC, our consulting firm, will take the sample results from the Ann Arbor and Ypsilanti water quality projects and through mathematical modeling, calculate approximate loads for chemicals monitored during the 1982 through 1986 Ypsilanti and Ann Arbor Water Quality Projects.

The sample stations established at the Allen Creek, Beyer, and Owen Drains will be monitored extensively during the first and fifth year of the project. $70,000 has been set aside in the 1987 budget and $120,000 in the 1991 budget to quantify the change in loadings for this type of non-point pollution abatement project.

A second type of sampling that will be conducted during this project is random grab samples from the various storm structures throughout the Abatement District. A sanitary survey of the storm sewer system will be conducted throughout the 5 year project to help isolate areas that have contamination and also to check areas after corrections have been made to ensure that further investigation is not necessary. Grabbing random samples from the storm drain sanitary surveys proved beneficial in the previous Ann Arbor and Ypsilanti projects to locate cross-connections in general areas where contamination was entering the storm drain system.

River samping is a third approach that will be undertaken by the project. Four sample stations have been established throughout the Abatement District along the Huron River. Stations have been set so that we can monitor the influence from some of the major storm drains entering the system, the urbanized area, and to measure the general water quality. The cities of Ypsilanti and Ann Arbor have plans to establish park connectors between the cities along the Huron River. This will increase people's awareness and utilization of the river. The river sampling will be conducted mainly in the first and last years, and we will be able to determine the impact this project has on the overall water quality.

The project will repeat Roger Copp's study of the Huron River in 1981 to the effect of removal of storm drain connections.

Soils samples will be collected in industrial areas that have historically been on drainfields. The data that we receive from the soils samples will answer questions of what happens to chemical contaminants once they get into a drainfield, and the need for different regulations for industry in rural areas. These soils samples will be collected by field personnel with written permission from the property owners. The Health Department has the legal authority to seek a warrant to conduct this investigation.

Dye-Testing:

Survey and dye-test are the nuts and bolts of the project. Dye-testing conducted in Ann Arbor and Ypsilanti from 1982-86 discovered 14% of the buildings dye-tested to have improper connections (see Appendix A). The Huron River Abatement Project personnel, as of July 1, 1987, have discovered 46 of 157 (29%) buildings dye-tested having improper connections. With present projection of a total of 4,200 businesses and buildings to be dye-tested during this five year program, the numbers become quite high (see Appendix E). For example, 20% of 4,200 parcels with improper connections would equal a total of 840 buildings/parcels with improper storm drain connections.

Data obtained from the previous projects in Ann Arbor and Ypsilanti demonstrate the relationship between the type of business and the likelihood of them having improper connections (see Appendix F). Similar results have been obtained this year (see Appendix G and H). For example, in the Ann Arbor Study, 75% of the automobile body shops had improper storm drain connections, while this year the project found 50% of the body shops in Ann Arbor and Scio Township had improper connections. The project will correlate through the sampling program whether it is more cost effective to target business by the type or rather check all establishments.

The survey is an important tool of the Abatement Project. The survey allows personnel to review with each business the various chemicals that the building has, how they are used, handled, stored, and disposed of. See Appendix H. Procedural problems can then be noted and corrected. Personnel are also able to give information to the various establishments such as a listing of places that accept used motor oil, batteries, or where places can properly dispose of hazardous waste that is accumulating, etc.

This survey form is an important link in Washtenaw County to other departments and agencies. See Appendix I. The data collected will be combined in a computerized database with Washtenaw County's Community Right-to-Know program to allow various personnel access to cross-referenced information pertaining to specific projects. Presently, Washtenaw County is an authorized agent of the Michigan Department of Natural Resources to conduct their Act 245 program which is a spill prevention program. We are also currently seeking approval for a small quantity generator inspection program in Washtenaw County.

Personnel:

Through an interdepartmental agreement with the Washtenaw County Health Department, the field teams are supplied by Environmental Health. A total of four teams, headed by a sanitarian and paired with an environmental assistant or student intern, complete the daily surveys and dye-tests. Each team works in an assigned drainage area until work in that area is completed (see Appendix J).

SUMMARY

The Huron River Pollution Abatement District was created by the Statutory Drainage Board for the purpose of identifying and eliminating sources of pollution in the City of Ann Arbor, Ann Arbor Township, Pittsfield Township, Superior Township, the City of Ypsilanti, and Ypsilanti Township.

Funding for the budget is obtained from special assessments levied by the Drainage Board onto the local municipalities (and in turn to individual property owners). The special assessments total is $325,000 per year.

In addition to eliminating the pollution sources, the project will quantify the improvement in water quality. This will establish the feasibility and cost/benefit of conducting this type of abatement project for use by governmental agencies throughout the country.

APPENDIX A

WATER QUALITY PROJECTS

SAMPLING AND INVESTIGATIVE EFFORTS:

	Bacteria	Chemical	Surveys	Dye-Tests	Connects	Completed	Cross Connections
Ypsilanti:							
1981-83	576	0	319	319	19	19	1
1984	346	438	49	49	3	0	6
1985	440	531	132	132	11	9	1
1981-85 Totals	1362	969	500	500	33	28	8
Ann Arbor:							
1982-83	811	0	8	7	4	3	
1984	83	468	75	63	32	16	
1985	206	757	65	90	25	15	
1982-85 Totals	1100	1225	148	160	61	34	
Huron River Pollution Abatement Project:							
1986	882	453				13	
1981-86 GRAND TOTALS	3344	2647	648	660	94	75	8

WATER QUALITY COMPLAINTS AND REPORTED SPILL INCIDENTS (1985-86):

1985	43
1986	53
TOTAL	96

APPENDIX B

CHEMICAL PARAMETERS

1984 TO 1986 COMPARISONS

	ALLEN CREEK 1984 AVGS.	ALLEN CREEK 1986 AVGS.	% CHANGE	ALLEN CREEK 1986 AVGS.	ARGO DAM 1986 AVGS.	% DIFF. BETWEEN ALLEN CREEK 86 AND ARGO DAM 86
AMMONIA	0.441	0.44	-0.2	0.44	0.03	93
NITRATE	0.632	0.49	-22	0.49	0.26	47
ORTHO-PO4	0.115	0.06	-48	0.06	0.02	67
SULFATE	83.333	0	-100	0	0	0
TKN	1.430	0	-100	0	0	0
TOTAL-P	0.215	0.62	+188	0.62	0.19	69
ALKALINITY	178.000	187	+4.6	187	220	18
CONDUCTIVITY	910.000	687	-25	687	620	9.8
pH	7.710	7.5	-2.6	7.5	8.2	8.5
TDS	593.000	443	-25	443	355	20
TSS	72.600	44.7	-38	44.7	6.3	86
TR	705.556	513	-27	513	365	29
TURBIDITY	22.400	22	-2.1	22	3.1	86
MBAS	0.187	0.03	-84	0.03	0.02	33
O+G	6.400	1.3	-80	1.3	<1	>23
PHENOLS	0.027	0.01	-63	0.01	<0.01	>0
TOC	17.900	9.7	-46	9.7	9	7.2
ALUMINUM	1.198	0.84	-30	0.84	<0.1	>88
ARSENIC	0.004	0	-100	0	0	0
BARIUM	0.070	0	-100	0	0	0
CADMIUM	0.011	0.01	-9	0.01	<0.01	>0
CHROMIUM	0.020	0	-100	0	0	0
COPPER	0.040	0.02	-50	0.02	<0.02	>0
IRON	5.236	2.1	-60	2.1	0.17	92
LEAD	0.072	0.06	-17	0.06	<0.05	>17
MANGANESE	0.203 ND	0.13	-36	0.13	0.04	69
MERCURY	(0.0002)	0	0	0	0	0
NICKEL	0.023 ND	0	-100	0	0	0
SELENIUM	(0.001)	0	0	0	0	0
SILVER	0.019	<0.02	-	<0.02	<0.02	0
ZINC	0.377	0.11	-81	0.11	0.03	73
CHLORIDE	160.200	61	-62	61	41	33
CYANIDE	0.016	0.01	-38	0.01	<0.01	>0
FLUORIDE	0.483	0	-100	0	0	0
SODIUM	56.667	0	-100	0	0	0
TOX-BR	0.009	<0.01	-	<0.01	0.01	>0
TOX-CL	0.338	<0.01	-	<0.01	<0.01	0
TOX-I	0.008	<0.01	-	<0.01	<0.01	0

APPENDIX C

HURON RIVER POLLUTION ABATEMENT DISTRICT

Acreage by Zoning Classifications

Municipality	Residential	Commercial	Industrial	Agricultural	Tax-Exempt	Total
ANN ARBOR CITY	9,288	1,502	644	0	4,837	16,271
ANN ARBOR TWP	1,290	12	42	0	526	1,970
PITTSFIELD TWP.	965	272	30	280	166	1,713
SCIO TWP.	501	444	236	935	79	2,195
SUPERIOR TWP.	482	229	13	112	170	1,006
YPSILANTI CITY	985	105	94	0	1,356	2,540
YPSILANTI TWP.	3,771	1,167	774	21	1,235	6,968
TOTALS	17,382	3,731	1,833	1,348	8,369	32,663
PER CENT	53	11	6	4	26	

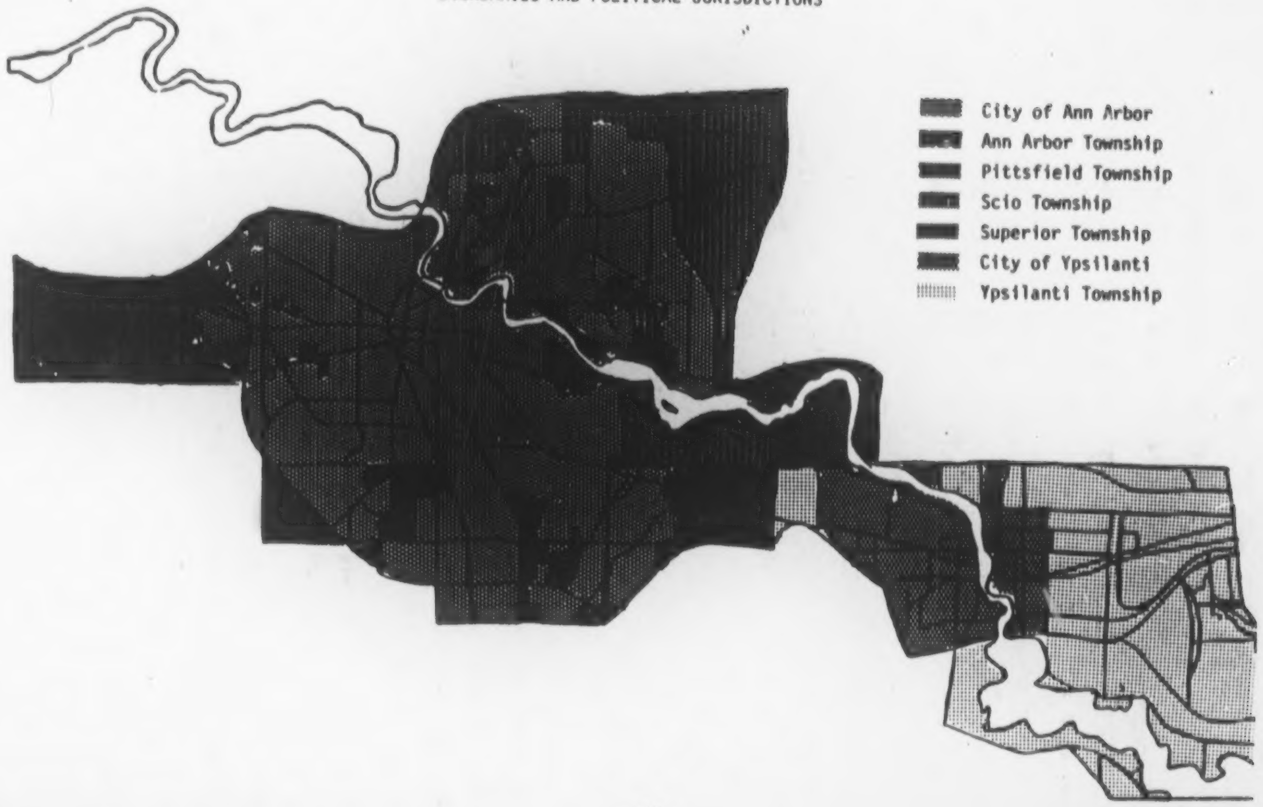
GRAND TOTAL - 32,633

Number of Parcels by Zoning Classification

Municipality	Residential	Commercial	Industrial	Agricultural	Tax-Exempt	Total
ANN ARBOR CITY	21,592	1,204	128	0	819	23,743
ANN ARBOR TWP.	750	71	8	0	40	869
PITTSFIELD TWP.	786	142	6	2	36	972
SCIO TOWNSHIP	605	99	89	9	25	827
SUPERIOR TWP.	47	16	4	3	10	80
YPSILANTI TWP.	7,409	450	146	1	337	8,343
YPSILANTI CITY	4,057	579	45	0	288	4,969
TOTALS	35,246	2,561	426	15	1,555	39,803
PER CENT	90	6	1	-	3	

APPENDIX C (Cont.)

HURON RIVER POLLUTION ABATEMENT DISTRICT
BOUNDARIES AND POLITICAL JURISDICTIONS


▨ City of Ann Arbor
▨ Ann Arbor Township
▨ Pittsfield Township
▨ Scio Township
▨ Superior Township
▨ City of Ypsilanti
▨ Ypsilanti Township

APPENDIX D

Storm Drain Samples:

Group I

Oil and grease
Total Suspended Solids
Total Phosphorus
Total Organic Carbon
Cadmium
Chromium
Lead
Fecal Coliform
pH
Conductivity

Group II

Nitrate
Ammonia
Tox
Zinc
Chloride

River Samples:

Group I

Oil and grease
Total suspended solids
Total phosphorus
Total organic carbon
Cadmium
Chromium
Lead
Fecal coliform
pH
Conductivity

Group II

Nitrate
Ammonia
Tox
Zinc
Chloride
BOD_5
Turbidity
Total dissolved solids

Soil/Sediment Samples:

Volatiles - by GC/MS
Base/neutral/acids - by BC/MC
Metals - 13 PP metals
Cyanide - total
Phenolics - total

APPENDIX E

Huron River Pollution Abatement Project
Projections 1987-1991

* * * *

Total number of parcels in district -

Residential -	36,236
Commercial -	2,333
Industrial -	377
Tax-exempt -	1,259
Total	40,205

Total # establishments tested through 6-30-87	157
Remainder to be tested in 1987	380
# of establishments completed 1982-86	
City of Ann Arbor	148
City of Ypsilanti	100
Total tested (1982-87) through 6-30-87	405
Residential projection (1987)	25
Residential projection (1988-91)	140

Total number of establishments to be tested

1987	537
1988	850
1989	1,056
1990	1,110
1991	555
Total (with residential)	4,273

Total No. of Businesses to be Dye-Tested (1987-91)	% with Improper Connections	Total No. Improper Connections Expected
4200	25	1,050
	20	840
	15	630
	10	420

ANN ARBOR WATER QUALITY PROJECT
1984 - 1985

Business Type	No. of Establishments Dye-Tested	% Connected to Storm Drain
Auto repair shops/tire stores[a]	26	65
Service stations[a]	16	63
Printers/Copiers[b]	11	9
Manufacturers[a,b,c]	9	56
Dry cleaners/laundries[b]	9	0
Government facilities[a,b,c]	5	80
Auto parts stores[a]	5	40
Auto body shops[a]	4	75
University facilities[c]	4	75
Muffler/transmission shops[a]	4	50
Car washes[a]	4	50
Auto dealerships[a]	3	100
Auto/truck rental agencies[a]	3	33
Photographic processors[b]	3	33
Utilities[b]	3	33
Private service agencies[c]	2	50
Train/bus stations[a]	2	0
Paint stores[b,c]	2	0
Plating shops[b]	1	100
Water conditioning companies[b]	1	100
Party stores[c]	1	100
Private homes[c]	1	100
Chemical laboratories[b]	1	0
Construction companies[b]	1	0

[a] Priority I businesses
[b] Priority II businesses
[c] Non-prioritized businesses

APPENDIX G

HURON RIVER POLLUTION ABATEMENT PROJECT
SCIO DRAINAGE AREA
As of June 30, 1987

		NUMBER	IMPROPER		CORRECTIONS	
BUSINESS TYPE	SURVEYED	DYE-TESTED	CONNECTIONS	%	MADE	%
Agriculture/Nursery	1	1	0	0	0	0
Auto body shops	5	4	2	50	0	0
Auto repair shops/tire stor.	2	2	1	50	0	0
Auto/truck rental agencies	0	0	0	NA	0	NA
Car washes	0	0	0	NA	0	NA
Construction companies	0	0	0	NA	0	NA
Food/Restaurants	2	2	0	0	0	0
Government facilities	0	0	0	NA	0	NA
Hospitals	0	0	0	NA	0	NA
Manufacturers	3	2	2	100	0	0
Motel/Hotel	1	1	0	0	0	0
Office buildings	6	5	0	0	0	0
Printers/Copiers	2	2	2	100	0	0
Private service agencies	7	5	1	20	0	0
Schools/Churches	0	0	0	NA	0	NA
Scrap yards	0	0	0	NA	0	NA
Service stations	1	1	0	0	0	0
Silkscreening/Paints shops	0	0	0	NA	0	NA
Utilities	0	0	0	NA	0	NA
Clubs/Organizations	1	0	0	NA	0	NA
Wholesale/Retail	10	8	7	88	0	0
TOTALS	41	33	15	45	0	0

APPENDIX H

HURON RIVER POLLUTION ABATEMENT PROJECT
ANN ARBOR DRAINAGE AREA
As of June 30, 1987

BUSINESS TYPE	SURVEYED	NUMBER DYE-TESTED	IMPROPER CONNECTIONS	%	CORRECTIONS MADE	%
Agricultural/Nursery	0	0	0	NA	0	NA
Auto body shops	2	2	1	50	0	0
Auto repair shops/tire stores	8	7	3	43	3	100
Auto/truck rental agencies	1	1	1	100	0	0
Car washes	2	2	0	0	0	0
Construction companies	2	1	1	100	1	100
Food/Restaurants	11	11	2	18	1	50
Government facilities	2	2	1	50	0	0
Hospitals	1	1	0	0	0	0
Manufacturers	5	5	1	20	0	0
Motel/Hotel	1	1	0	0	0	0
Office buildings	35	33	5	15	1	20
Printers/Copiers	3	3	1	33	0	0
Private service agencies	12	11	3	27	0	0
Schools/Church	7	6	2	33	0	0
Scrap yards	3	2	0	0	0	0
Service stations	0	0	0	NA	0	NA
Silkscreening/Paint shops	7	7	3	43	1	33
Utilities	2	2	2	100	0	0
Clubs/Organizations	3	3	0	NA	0	NA
Wholesale/Retail	24	24	5	21	0	0
TOTALS	131	124	31	25	7	23

APPENDIX I

BUSINESS TYPE____

COMPANY NAME____

ADDRESS______________________________ CITY________________

ZIP ________ PHONE__________________ DATE__________________

CONTACT PERSON______________________TITLE__________________

INFORMATION SOURCES: __FILE ___PERSON ___LABEL ___MSDS ___OTHER

(SPECIFY)____

HAZARDOUS MATERIAL:___HANDLED___STORED___MANUFACTURED___APPROXIMATE TOTAL AMOUNT

STORED PROPERLY? ___YES ___NO (IF NO, EXPLAIN UNDER COMMENTS)

COMMENTS____

WASTE GENERATED? ___YES ___NO MANIFESTED PROPERLY? ___YES ___NO

TYPES OF WASTE/AMOUNT_____________________________________

NAME OF HAULER____

ADDRESS ____

CITY_________________ STATE_____________________ ZIP_________

EPA ID# ____

DESTINATION____

ADDRESS____

STATE________________ ZIP____________ PHONE ________________

NPDES? ___YES ___NO IF NO, IS ONE NEEDED? ___YES ___NO

COMMENTS:____

PIP PLAN? ___YES ___NO IF NO, IS ONE NEEDED? ___YES ___NO

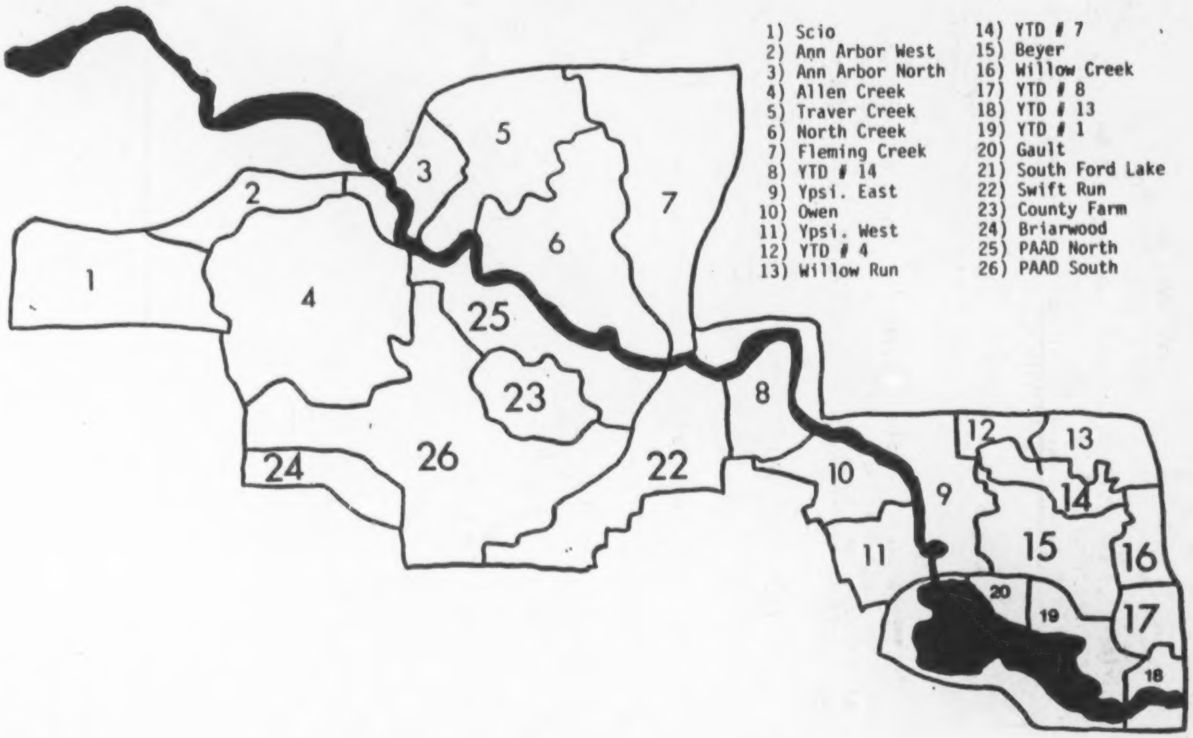
REVIEWED BY__________________ DATE_________ APPROVED ___YES ___NO

COMMENTS:____

APPENDIX J

HURON RIVER POLLUTION ABATEMENT PROJECT

SUB-DRAINAGE AREAS


1) Scio
2) Ann Arbor West
3) Ann Arbor North
4) Allen Creek
5) Traver Creek
6) North Creek
7) Fleming Creek
8) YTD # 14
9) Ypsi. East
10) Owen
11) Ypsi. West
12) YTD # 4
13) Willow Run
14) YTD # 7
15) Beyer
16) Willow Creek
17) YTD # 8
18) YTD # 13
19) YTD # 1
20) Gault
21) South Ford Lake
22) Swift Run
23) County Farm
24) Briarwood
25) PAAD North
26) PAAD South
1
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TESTIMONY OF

CALIFORNIA ASSOCIATION OF SANITATION AGENCIES

PRESENTED BY
RAYMOND C. MILLER
MANAGER, SOUTH COAST WATER DISTRICT
LAGUNA BEACH, CALIFORNIA

BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
U.S. HOUSE OF REPRESENTATIVES

MARCH 21, 1990

Mr. Chairman and members of the Subcommittee, I am Raymond C. Miller, General Manager, South Coast Water District, Laguna Beach, California. I am here today as President of the California Association of Sanitation Agencies (CASA).

CASA is a an association of 89 wastewater treatment agencies within California. Our members collectively serve more than 12 million people and the related industrial and commercial facilities throughout California. Since 1956, CASA has worked to promote sound public policy related to the implementation of water pollution programs mandated at the local, state, and federal levels.

On behalf of CASA, thank you for allowing us to present our views on the need for reauthorization of section 205 of the Clean Water Act. The state revolving loan fund allocation formula.

In addition to this key matter, CASA also wishes to briefly discuss three other issues:

1. Appropriating $2.4 billion for SRFs: Congress is reviewing the President's fiscal year 1991 budget request. As part of this, decisions on the state revolving loan program (Title VI, Water Quality Act) will be important to the ultimate success of the new program.

2. Issuing regulations in response to legislative mandates: An improved process to ensure good peer input early on in the development of regulations is necessary. EPA promulgation of sludge standards (section 405 of the Clean Water Act) is an example of what occurs when peer input and review is limited

during development of a complex rule.

3. Improving Water Quality Policy: The development of water quality standards and the need to focus on toxic constituent levels (section 304(l)) without balancing environmental gain is an issue that will create future conflicts over priorities. Congress needs to review this situation and provide states with authority to address the unique conflict between designated uses and section 304(l).

Renewing the State Revolving Loan Fund Allocation Formula

In 1987, Congress passed the Water Quality Act of 1987. A pivotal point in water pollution policy, it required a transition from wastewater treatment grants to loans. As part of this transition, a phase-in was developed marking fiscal year 1991 as the time when all funding for grants would end and funding of loans would occur.

Since enactment, CASA has worked with the State of California and EPA to ensure a successful state revolving loan fund program. California has a program in place that minimizes regulatory "red tape", promotes timely construction of wastewater treatment projects, and allocates its fiscal year 1989 and 1990 funding.

The California program was developed on the premise that Congress would fund the program at levels at the authorized level of $2.4 billion.

Under the existing formula, contained in Title II, California is designated to receive 7.2333 percent of appropriated amounts. In the past few years, this has averaged approximately $142 million. If deficit reduction efforts and set-aside project funding had not affected this program, California would have received $174 million each year. When we consider the two-for-one benefits of the loan program, this means a loss of almost $60 million per year in the ability to construct wastewater treatment projects. Despite these limitations, CASA has worked toward compliance with the federal Clean Water Act.

CASA is deeply concerned that there is a temptation, on the part of some, to discontinue the federal, state, and local partnership. Lest there be any misunderstanding, CASA believes clean water is a policy objective that requires the partnership of all levels of government. Clean water is no less important than global warming initiatives, transportation infrastructure, or financial industry bailouts.

We hope the rush to develop new and creative ways to respond to pressing domestic policy matters does not manifest itself in reductions in programs such as the newly established state revolving loan fund program. Keeping in mind that CASA has supported this program since the first debate over how to ensure a long-term commitment to restore the nation's waters, we urge you today to:

- recognize the planning and financial commitments that have taken place at the local and state levels based on the projected share of federal funds to ensure compliance with clean water mandates

- maintain the existing section 205 formula for the next fiscal year to preserve the delicate balance of financing arrangements that will support state loan fund solvency

- review the allocation formula using the results of the decennial census along with other relevant data in 1991 to ensure that the needs of high growth rate states (either from in-state growth or inter-state migration) are adequately reflected during final stages of the loan program's first full term of operation

The legislative year is short and the schedule crowded. We therefore urge the Subcommittee to avoid wholesale revisions to the allocation formula and instead provide a one-year extension of the existing allocation formula.

Of equal importance to the allocation formula is Congress' commitment to provide resources to support the revolving loan fund program.

Once again, CASA comes before this Subcommittee to urge support of a full state revolving loan fund appropriation--$2.4 billion. We make this request fully aware of the Subcommittee's unwavering past commitment to the program. Mr. Chairman, you, and your colleagues have managed to communicate the importance of this program to the Budget and Appropriations Committees. For this we are grateful.

EPA estimates that California requires more than $5.0 billion to meet existing federally eligible construction needs during this decade. This does not take into account activities considered ineligible for federal assistance. Last year, California implemented the state revolving loan fund. This fund should ensure a self-sustaining source of revenue to meet future clean water needs in addition to the statutory requirements of the Clean Water Act. At the existing appropriation levels, California could realize approximately $700 million in federal assistance to meet the $5.0 billion in needs.

CASA, working with state clean water authorities, began work to implement this program with the hope that promises for full funding--$2.4 billion--would be met. Unfortunately, this has not been the case with actual appropriations. While having exceeded Administration requests, appropriations have fallen several million dollars below the authorized level. Last year, Congress made significant inroads to correct this situation. You increased funding over the previous year, despite the pressure of Gramm/Rudman.

As fiscal year 1991 appropriations decisions begin to be made, CASA urges you to support a $2.4 billion appropriation. This year full funding is critical. Fiscal year 1991 marks the first year in which all available funds must be used for state revolving loan funds. California made the decision in 1989 to put all of the federal grants in the state revolving loan fund. Any decrease in appropriated amounts could jeopardize the fiscal stability of California's loan program. Disruption of planned projects and on-going projects would result.

With the twentieth anniversary of Earth Day just one month away, we urge you, Mr. Chairman, and the other members of the Committee, to reject the Administration request of $1.2 billion and again support a full appropriation. This is one important way for Congress to demonstrate its commitment to the environment.

Responding to Legislative Mandates and the Importance of Peer Review to the Regulatory Development Process

The Water Quality Act of 1987 mandated EPA to issue standards for the disposal of sewage sludge. As we are all aware, the proposed regulations were issued shortly before a court deadline for hearing an environmental interest group's suit urging immediate promulgation of the rule.

When EPA published the proposed regulation, CASA carefully reviewed the proposal. We found the rule overly long and cumbersome, more than 3,000 pages in length. We found the rule was based on inappropriate assumptions. The rule was founded on incomplete or incorrect data. Furthermore, after several years of EPA research, analysis, and policy development, a rule was proposed that served to harm the recycling markets because of questions about the safety of composted materials. In fact only a few days ago the Bureau of Land Management issued a statement it will no longer allow the use of composted materials from sewage sludge on nonproductive lands.

CASA and its members have spent thousands of dollars and incalculable hours of staff time to review the sludge technical standards. Unfortunately, we concluded the regulation was scientifically flawed. This was not a unique conclusion. CASA found its position in line with the EPA Science Advisory Board and the Peer Review Group which determine if proposed rules are scientifically supportable.

More than $15 million was spent nationally by local entities to prepare 5,000 pages of comments on the rule. A process which takes years to generate regulations only to require larger investments to point out areas of improvement needs to be changed.

The clean water issues of the nineties and beyond are highly technical. CASA highlights this fact because we and the communities we serve believe the regulatory rule-making process needs to be revised to enable peer input early-on in the process. When risk assessment models and levels of risk are decided upon, peer review should then take place. Often this can be in the beginning of the development of a regulation.

The proposed sludge regulation is a case study on what happens when technical advice to support EPA on complex policy matters is limited (or is relied upon after the fact). The present use and timing of peer review is an inefficient and ineffective way to support regulation development.

A new mechanism that involves the selection of intelligent, technically qualified experts, through organizations like the National Academy of Science or other similar groups must be available to provide uncompromised input. This would not be a novel idea. In other arenas of the federal rulemaking process, technical, industry, and consumer representatives sit with an agency to consider planned policies and recommend actions. The key would be to establish a group outside of EPA which can utilize a creditable procedure for convening peer groups for different assignments as needed by the Agency. Peer review and the use of risk assessment decisions after the regulations are drafted and published for comment is costly and a waste of time.

CASA believes these recommendations offer an effective way to ensure technically defensible rules are proposed and to avoid future rulemaking delays.

Balancing Competing Requirements of Setting Water Quality Standards and the Decisions Needed for Prioritizing Environmental Gains

One of the most important actions initiated since enactment of the Water Quality Act is implementation of sections 304(l) and 303(c)(2)(B). Section 304(l) ensures that any segment of a body of water that would not achieve water quality standards would have an individual control strategy to bring it into compliance and 303(c)(2)(B) requires the adoption of standards for individual constituents.

Unfortunately, current implementation trends of section 303(c)(2)(B) through section 304(l) of the Clean Water Act emphasize constituent-by-constituent toxic levels without considering how to effect environmental gains. This process will require the identification of sources of the constituent causing the problem and working out solutions. POTWs may be spending considerable resources on meeting a constituent level when the environmental problem is caused by urban run-off or agricultural drainage.

Legislation and regulations aimed at controlling pollutants constituent-by-constituent do not ensure environmental improvement and prevents the balancing needed to direct resources at the causes of water quality impairment.

CASA and other POTWs are capable of responding to problems without delay. Recent EPA awards in excellence testify to this fact. However, because a POTW is easily identified for evaluation on a constituent-by-constituent basis, EPA and the states are targeting POTWs without considering what other ways may be appropriate to cleanup the problem. Ironically, a POTW discharge may represent only 1% of a specific pollution problem, but almost 100% of the regulatory agency's response may be directed at this portion. Such a plan of action fails to address the priority mission--responding to circumstances that pose environmental harm or impair the water's beneficial use.

CASA raises this matter because the limited ability to finance necessary controls and the outstanding priorities for compliance with the Clean Water Act require Congress to re-examine this situation.

CASA is dedicated to improved water quality and we do not urge exemptions from section 304(l). Instead, flexibility to address sources of pollution posing long-term "environmental harm or beneficial impairment" of a water body in question should be allowed. Targeting constituent-by-constituent toxic levels without consideration to actual impact (or major source) is a wasteful use of limited water pollution control resources. We need to set priorities. Cleanups that target contributors, through sections 303(c)(2)(B) and 304(l), without reference to the ultimate improvements in water quality impair our ability to attain clean water goals. We need to direct such activities to target the major contributors to the pollution problem. Quite simply, meeting environmental mandates in the future requires study to determine if the approaches used in the 1970s and 1980s will work for the problems of the 1990s. Cross-media impacts, balancing, waste allocation, and local mass emission strategies will emerge as effective tools for the future as "end of pipe" regulations prove themselves outdated approaches.

This concludes my formal testimony. I would be pleased to respond to any questions you or the other Members of the Subcommittee may have.

TESTIMONY BEFORE THE SUBCOMMITTEE
ON WATER RESOURCES COMMITTEE ON
PUBLIC WORKS AND TRANSPORTATION

March 21, 1990

Remarks by: James E. Murray, Director of Public Works
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Mr. Chair and Members of the SubCommittee:

Thank you for the opportunity to appear before you today. My name is James Murray, Director of Public Works for Wayne County, Michigan.

Today the United States has reached a benchmark in its Water Quality objectives; that is the control of point source discharges is virtually under control throughout the Nation.

The passage of the Clean Water Act of 1972, has provided dramatic improvement to the nation's surface waters. Rivers that once burned are now flowing cleaner and supporting more uses. Even Lake Erie, once considered destined to become a parking lot, has made dramatic improvement. Throughout the nation similar success stories abound. The progress made to date is a tribute to the tremendous effort of the nation's leaders to provide the direction and funding necessary to accomplish what has been achieved.

However, even in light of our successes, the nation's waters still remain threatened. Pollutants discharged into our nation's waters during wet weather events have been documented to impair the surface water of this nation beyond acceptable limits and threaten the long term sustainability of our surface waters' resources.

Since the passage of the Clean Water Act, the Federal government has struggled with the regulatory approach to controlling wet weather discharges. At every attempt it has proved difficult if not impossible to move forward. Only in limited areas, at great Federal and local expense, has any meaningful attempt been made to control wet weather discharges.

In an effort to move ahead with the charge of the Federal Clean Water Act, the U.S. E.P.A. has moved to implement a combined sewer overflow discharge regulation program and also to move ahead with the rules for controlling non point sources of pollutant discharges. Even though these discharge events occur only in wet weather and the control mechanism available for control of the discharge of both are essentially the same, the Federal government has failed to integrate these programs.

The result is the emergence of a tremendously expensive program that has very little chance of implementability. For instance in Michigan, the Michigan Department of Natural Resources (MDNR), in conjunction with the United States Environmental Protection Agency (U.S. E.P.A.), has initiated a combined sewer overflow (CSO) Strategy to control CSO discharges. The emphasis of this program is construction of facilities at the end of pipe. The proposed CSO Strategy could cost Michigan taxpayers $4-$5 billion to implement. In Southeast Michigan alone the cost could reach $3 billion.

In Michigan, the CSO Strategy does not consider water quality impacts from separated storm sewers. Regulations for controlling discharge from separated storm water sewers is currently emerging from the U.S. E.P.A. Studies conducted under the 208 and NURP Programs indicate that pollutant loads of this type in urban areas contribute significant pollutant loads to our surface waters. The requirements for meeting the proposed storm water discharge requirements could easily equal that estimated for meeting the cost of the proposed CSO program.

As of yet, the EPA and MDNR have not tried to integrate the CSO and storm water discharge control programs. Since both discharge only in wet weather, we feel greater pollution control, program efficiency and cost savings can be realized by integrating the programs. Wayne County has developed a proposal to integrate these programs, provides the framework by which such integration could occur and will document the achieveability of the approaches outlined. It is felt that as much as 50% of the program cost for CSO control can be saved. Comparable cost for storm water controls could also be achieved.

I have attached small studies began in Washtenaw County and Wayne County to the Proposal which suggest why we have come to this conclusion. These studies point out many of the problems of water quality in urban stormwater discharges will be lessened with the implementation of certain best management practices.

By following the proposed approach instead of the proposed Federal CSO and NPS programs the following deficiencies in the Federal program will be avoided.

1) NPDES stormwater regulations are not in effect for many municipalities/industries and required "level of control" of stormwater has not been defined in regulations.

2) BMP's for CSO are identical to those for stormwater since CSO is mostly stormwater. By limiting upstream discharges less sediment contribution and less volume at time of peak CSO could be realized. The "level of control" required has not been defined in regulations for CSO under WWTP NPDES permits.

3) Where large scale structural EPA partially funded CSO and stormwater control projects have been undertaken (Chicago, Milwaukee), the cost has been excessive. A BMP approach with non-structural solutions and public involvement is required from a cost standpoint. Imagine the

collection system as a river basin in need of flood-control. It may be more effective to construct many small dams (i.e., detention basins) rather than one large dam. TARP (while being off-line) requires that all of the water discharge at the peak of a storm be collected. Multiple detention basins at thousands of private locations would dampen the peak and allow a much smaller TARP to solve the water quality problem. This also has the effect of sharing the capital and O & M cost between the public and private sector.

4) The method for "targeting" areas can be more simply determined. Branches of streams with the highest exposure and valve to the public such as the Middle Rouge would be cleaned up first, from the headwaters down to the mouth. Often, factors other than those listed in the ranking procedure (political and institutional arrangements, available site, public involvement) determine where a BMP will be tried.

5) The "Urban Targeting..." report is based on information and studies which are generally about 10 years old. Public awareness has increased dramatically in this time of environmental pollution. Air quality has improved in most urban areas with stricter control of auto and industrial emissions. Many BMP's require public involvement and overlap with solid and hazardous waste control programs currently being put in place. The reports states on P. 40

under 3.5.2, "There is no realistic way to accurately estimate the effect such practices may have on area-wide pollutant loads or to problems in specific water bodies." An increased public awareness and the economic realities make it necessary for us to try and test non-structural BMP's again.

6) Some investigations of sanitary sewer systems are necessary to ensure that storm drainage to sanitary sewers is eliminated as much as possible. Illegal discharges to the sanitary sewer system can cause problems such as wet weather back-ups and flooding.

7) The information gathered on BMP's in the Middle Rouge Basin will be transferable to other urban areas with combinations of combined sewer and storm drainage districts. Public acceptance and involvement of BMP's and solid and household hazardous waste measures will be estimated along with water quality improvements derived from the BMP's.

8) The "Urban Targeting..." report does not address the institutional changes that are necessary to implement a BMP. Urban stormwater control at the source will become like curb-side recycling. It is politically difficult to implement a program which causes the citizenry to perform a task that has been traditionally a DPW task. Public awareness and a desire to be environmentally responsible

change the way the public accepts these responsibilities. Stormwater and CSO control can be solved by massive public works' projects, but at a time that public funds are shrinking, a more cost-effective method is required.

9) Combined sewers are specifically excluded from this report by choice, but the same aspects driving urban storm water problems drive CSO, i.e..

1. Increased peak discharge
2. Run-off volume
3. Decreased response time (i.e., the TC peak gets there earlier).

10) 2.22 Using the "event mean" concentration

Assumes the goal is to catch everything and blinds the statistics to the effect of antecedent conditions. The 208 studies shows that more pollutant is caught by capturing the one-month storm than the one-year storm. Using the "event mean" concentration makes one focus on the large events because of the high volumes. Instream response data, sufficient to document water quality improvement and justify capturing these events is necessary if implementation of any meaningful water quality program funded primarily at the local level is to be achieved.

11) Limitation for both detention and retention devices should include maintenance and solids handling (what if soils flunk TCLP test?)

12) Source Controls -

Enforcer - Set proposed regulations and enforcement mechanism.

- Implement household hazardous waste program.

13) Reduce sheet and land surface source of pollution Identify and control R O from abandoned industrial facilities.

By and large the Federal government's report is a typical "208" document. It says all the right things, but is backed by very little data and ends each section with "There is no realistic way to accurately estimate the effect such practices may have on area-wide pollutant loads or to problems in specific water bodies" or "there is no" magic formula" that can be applied that will "decide" for a user, the most appropriate priority to assign for a a general implementation program".

These sentences alone justify the proposed study. The Federal government has placed a huge burden on the local communities. While the grant program was alive and well, it was decided that NPS projects and CSO projects were not cost effective. Now that the Federal government has passed the burden to local government, and cut and pasted from the same documents that killed N.P.S. projects 10 years ago, it's time for a new approach. This Proposal will quantify, verify and document the achieveability of the BMP in an urban area. It is a necessary effort to bridge the gap from where we left 10 years ago. For the local government to embrace this program and for the Federal government to broaden its support these needed water quality programs, real site specific information must be collected. With your support we can begin to shift the NPS problem from the public sector to the responsible party, where it rightly belongs.

Prepared Statements of Erwin Odeal
and Ed Wagner

Statement of the
Association of Metropolitan Sewerage Agencies
before the
Water Resources Subcommittee
# of the
House Public Works and Transportation Committee
on the
Clean Water Act

March 21, 1990

Mr. Chairman and members of the Subcommittee, I am Erwin Odeal, Director of the Northeast Ohio Regional Sewer District and President of the Association of Metropolitan Sewerage Agencies (AMSA). Joining me today in representing AMSA is Edward O. Wagner, Assistant Commissioner and Director of the Bureau of Wastewater Treatment in New York City's Department of Environmental Protection and Ken Kirk, AMSA's Executive Director. We are pleased to have the opportunity to testify before the Subcommittee and to provide our views as you initiate oversight and reauthorization of the Clean Water Act.

AMSA is a national organization composed of one hundred and fourteen of the nation's largest public wastewater treatment agencies serving more than 90 million citizens across the country. We share your goal of restoring and protecting water quality in our nation. In the years following the passage of the Clean Water Act, our members have made great advances in wastewater treatment, resulting in substantial reduction in pollutants discharged into the environment. For example, according to a recent pretreatment survey, since the implementation of pretreatment programs, total discharge of metals by AMSA members has declined from 80,870 pounds per day to 18,350 pounds per day -- a 77% decrease. Additionally, in 1989, AMSA members were among the winners of national Environmental Protection Agency (EPA) awards for industrial pretreatment, the recycling of sludge and facility operation.

This is not to say that more should not be done, but merely to emphasize that the substantial existing investments by all levels of government to date have improved conditions considerably. Our members are clearly treaters of this nation's wastewater, not polluters of this nation's waterways.

I should also note that this year marks the 20th Anniversary of AMSA, an important milestone that we share with the celebration of Earth Day and the creation of the Environmental Protection Agency. In its early years, AMSA worked diligently with the Congress to establish a viable federal funding program to support local efforts in achieving water quality objectives and also to ensure that projects to correct combined sewer overflows (CSOs) were eligible for federal grant support.

It now seems that we have gone full circle because, in spite of significant water quality improvements, we are still grappling today with the issue of how best to provide the funding support needed to address the unfinished water quality agenda.

As we begin our testimony, there are a few key messages we wish to share with the Subcommittee to set the stage for our later, more specific remarks.

Let me begin by encouraging you and your colleagues in Congress to continue your oversight of the activities of the U.S. Environmental Protection Agency as it proceeds to implement congressional actions through the development of criteria and standards, and the promulgation of regulations. Consistent and ongoing oversight will ensure that implementation actions parallel congressional intent.

The process of putting environmental programs in place starts with the Congress legislating and the EPA developing regulations. AMSA strongly supports additional funding for the Environmental Protection Agency to ensure that the appropriate level of resources are available to develop scientifically and technically sound regulations. Critical to the development of sound policies and regulations is a foundation of solid scientific information -- "good science" if you will -- to serve as the basis for regulatory efforts. Supported by good science, the local level is where the creative potential lies to deal with the next generation of water quality-based problems. In addition to this good science -- new technologies, expanded product bans, expanded technical assistance and information capabilities need to be provided at the federal level to help pave the way for local efforts directed at improving water quality.

With the enactment of the Clean Water Act in 1972, our members and others looked to EPA to exercise technical and financial leadership in combating pollution affecting our nation's waters. The Agency's work program, in the wake of the 1987 amendments to the Act, is already substantial -- as are the demands resulting from environmental mandates that state and local agencies must grapple with. It is clear that to ensure a successful response to any new initiatives, the Congress must first be prepared to provide reasonable time frames and ensure that the necessary research, technical assistance and staffing matches the task that you have set out for the country.

AMSA member agencies have had first-hand experience with the problems presented by accelerated, restrictive time frames for the development and promulgation of regulations and standards. We have learned through experience, most recently with regard to the sewage sludge technical regulations, that sufficient time for review and comment -- combined with provisions for peer review -- can greatly improve the process, eliminate waste of resources, and assist in achieving sound regulations. Consequently, we encourage you to support peer review as a major element of all regulatory development processes.

Additionally, the federal government must continue to exercise its leadership in developing clear and concise objectives that all of us can embrace and pursue at each level of government -- objectives that address the real problems of pollution. To this end, Congress and the Administration must be actively involved in building national consensus on these issues. It is important that your efforts foster a climate of support for programs, investments and intergovernmental cooperation needed to improve and protect our nation's waters -- support that recognizes the partnership of the federal, state and local governments necessary to address these complex issues.

A position contrary to this philosophy is reflected in the Bureau of Land Management's January 3, 1990 policy prohibiting the application of sewage sludge on public lands, even for beneficial purposes. This short-sighted and simplistic approach pre-empts EPA's ongoing regulatory process and runs contrary to their long-standing effort to promote local sludge recycling initiatives. Our members and other POTWs throughout the country receive an extremely conflicting message when the EPA encourages the beneficial use of sewage sludge and another arm of the federal government says, "but not in my back yard." It is this attitude that has plagued environmental clean-up efforts throughout the country over the years.

In our view, this policy should be reconsidered and revised immediately. We solicit your assistance in this regard to ensure that BLM policy is consistent with EPA's stated goals and objectives.

If the federal government continues to withdraw from the financing arena, AMSA encourages the Congress to carefully consider the overall impacts resulting from any new requirements. Since local governments are increasingly expected to contribute a higher proportion of funding for these programs and initiatives, local taxpayers must have a better appreciation of how these federal directives will translate into real environmental improvements. Water quality problems are site-specific and local flexibility -- for both problem identification and solution -- will be critical for local funding support. Priorities should be established through a comprehensive process that allows regulators and local entities to work together.

Legislation and regulations aimed at controlling pollutants, constituent by constituent, do not ensure environmental improvement and prevent the balancing needed to direct resources at the causes of water quality impairment. The whole issue of how to meet future environmental mandates requires study to determine if the approaches used in the 70's and 80's will work for the problems of the 90's. Cross media impacts, balancing, waste allocation, and local environmental strategies will emerge as effective tools for the future as "end of the pipe" regulations prove themselves to be outdated.

In the coming months, AMSA plans to dedicate considerable effort to developing approaches for dealing with the bigger environmental picture of which it is a part. By utilizing the knowledge and expertise of our members, we plan to develop a specific legislative proposal that builds upon the accomplishments already achieved under the Clean Water Act and allows us to move forward in an environmentally sound and results-oriented manner to make additional significant water quality improvements in the future. We would like very much to work with you and your staff as we develop this proposal over the next several months.

And now, a few words about enforcement. As I noted earlier, we are treaters, not polluters. We are partners with the federal and state governments in helping clean our nation's waters. And we would like to be treated as partners with you in this process. We acknowledge that enforcement actions may be appropriate in some instances, but we cannot support the current system where penalities and fines are placed in the federal treasury -- and not utilized to protect or clean up the environment on whose behalf they were assessed. Therefore I encourage you today to give serious consideration to an alternative approach that would provide that monies collected through environmental enforcement actions be utilized directly for continued protection of the environment. Additionally, I encourage you to be sensitive to the fact that enforcement actions against local agencies that are proceeding in good faith with environmental clean-up efforts are counter-productive and run the risk of eroding public confidence in all our efforts to protect the environment. This is particularly true as permit violations are applied to indicators that are still in the scientific development stage.

AMSA members have made great strides in protecting the environment through industrial pretreatment and appropriate treatment of our nation's wastewater. Continuing efforts are well underway. At this point in time, it is important to look at all issues affecting our environment from an integrated point of view. POTWs are not only involved in municipal wastewater treatment issues -- we are involved in clean air issues, Superfund issues, stormwater management, the control of nonpoint sources of pollution, solid waste and a myriad of other areas. Again let me emphasize that we are a partner with both the federal and state governments in working toward a mutual goal, the protection of our national environment.

Now, I will turn the microphone over to Ed Wagner to complete AMSA's remarks.

Mr. Chairman, I too am pleased to appear today before you and the members of the Water Resources Subcommittee. As Erwin noted earlier, I am an Assistant Commissioner and Director of the Bureau of Wastewater Treatment in New York City's Department of Environmental Protection and a member of AMSA. I plan, in my remarks, to focus on a number of specific issues addressed within the context of the Clean Water Act.

With regard to the management of sludge. . .

AMSA fully supports congressional and Environmental Protection Agency efforts to develop a comprehensive set of sludge management regulations and encourages the Agency to regulate municipal sludge as specified under the Clean Water Act. We believe, however, that the sludge regulations, as originally drafted and proposed, provide a clear example of what happens when a complex scientific issue is developed without intensive peer review throughout the process. This is compounded by EPA's lack of resources to fill in the science and data gaps.

As the major organization supporting the peer review effort on the sludge regulations, AMSA worked closely with the Environmental Protection Agency as the review of the regulations proceeded. We expect that the recommendations of the Peer Review Committee will be considered carefully by the EPA as they develop the final rule. AMSA does believe that the EPA is taking the recommendations of the Peer Review Committee seriously -- revising the regulations as it sees appropriate -- with the intent of developing a final rule that is both scientifically and technically sound. Our point is that peer review -- after the regulations are drafted and out for comment -- is costly (approximately $10 million was spent developing 50,000 pages of comments) and wastes time.

AMSA supports the beneficial use of sludge whenever technically and economically feasible; however, AMSA believes that other environmentally sound and site-specific management options also exist and should not be foreclosed. The evidence is that, for the most part, all of the present management options used nationwide pose no significant human health or environmental risk. Our objective should be to ensure that that continues to be true in the future. In New York City, for example, we have begun to invest tremendous sums of money in land-based alternatives for sludge management. We are working closely with the private sector to find both interim and permanent land-based sludge management alternatives that make beneficial use of sludge's organic qualities. That goal is going to be difficult to obtain, and we will need the help of those who so fervently argued that sludge should be taken out of the ocean. Fair consideration of all environmentally sound alternatives should be permitted in order to give localities needed flexibility to fashion appropriate sludge management programs.

With regard to combined sewer overflows. . .

AMSA recognizes the problems presented by combined sewer overflows (CSOs) and believes that the technology exists to successfully minimize and control discharges in such a way as to protect water quality and ensure environmental integrity. Combined sewer overflows are an environmental issue in many communities -- not only along our coast, but inland as well -- with very serious funding consequences tied directly to how Congress and the Environmental Protection Agency address the problem. CSOs are not susceptible to a technological standard due to the highly site-specific nature of the problem and receiving environment. Local flexibility to meet federal directives will be critical to this issue.

While AMSA supports the EPA's overall CSO strategy, it is our view that sufficient resources do not exist at the federal, state or local level for its implementation. We are currently reviewing EPA's guidance for permit writers and our initial analysis indicates that additional resources, time and effort should be spent to ensure that the guidance document reflects the intent of the strategy. Additionally, we are concerned that many of the initial state strategies submitted to EPA may -- in EPA's assessment -- require substantial revision before the program can move forward. We therefore encourage you, as your oversight process continues, to take a closer look at this implementation process and the environmental gains you desire. As you do so, please keep in mind two important points; 1) that local agencies have been addressing CSO problems for some time now, and 2) that local conditions can have a large impact on just how those problems need to be addressed.

Federally-mandated "end of the pipe" strategies can be counter-productive. Every effort should be made to ensure, as EPA's permitting process is initiated, that permit writers consider these local conditions and have the flexibility to take into account the plans that have already been developed and implemented at the local level to address CSOs. We are also concerned that, focusing solely on CSOs without regard to urban and agricultural runoff, and other relevant issues, does not reflect an integrated approach to addressing all aspects of urban water pollution management and control.

Combined sewer overflows are a wet weather phenomenon that occurs intermittently. The quality of the discharges may vary considerably from storm event to storm event. AMSA urges Congress to recognize that approaches developed for year-round, continuous and generally invariable discharges -- secondary treatment, for example -- are not applicable to wet weather discharges like CSOs. Significant effort must be expended in this area to develop approaches for dealing with these discharges, and we recommend that your Subcommittee give this consideration during the reauthorization process.

With regard to stormwater management. . .

AMSA recognizes and supports the need to address the management of stormwater. Toward this end, AMSA encourages Congress and the U.S. Environmental Protection Agency to recognize that an effective program for controlling this widespread and complex issue should be predicated upon providing the flexibility to use local solutions for local water quality problems. Additionally, we encourage the Subcommittee to acknowledge the need to manage not just urban storm runoff, but also agricultural and riverine impacts, as both relate directly to water quality.

AMSA believes that state and local governments should be given broad flexibility in developing guidelines and abatement programs aimed at controlling pollutants in stormwater. We urge Congress to assist in this area by expanding its efforts to ban and limit the use of materials, chemicals and activities by individuals and companies which contribute to water quality problems.

AMSA encourages Congress to place special oversight on the Environmental Protection Agency's regulatory efforts with regard to stormwater, and review congressional intent relative to the 1987 Clean Water Act amendments addressing stormwater.

With regard to toxics. . .

AMSA supports the concept of preventing the discharge of materials in concentrations that have been demonstrated to be toxic to aquatic or human life and has offered both its time and expertise in working with the U.S. Environmental Protection Agency in sponsoring workshops on toxics control. However, AMSA believes that the EPA's interpretation of the Clean Water Act requirements pertaining to whole effluent toxicity limits (applying a pass/fail approach to toxicity assessment) has created, and will continue to create, a major impediment to the control of toxics. The current EPA approach to whole effluent toxicity control is incorrectly focused on producing fishable, swimmable effluent, instead of protecting beneficial uses of receiving waters.

We support the use of whole effluent toxicity (WET) tests as useful scientific tools in the detection and monitoring of toxics in the nation's waters. Implementation of these tests should recognize their technical capabilities and limits, and should appropriately link permit requirements to use designation and water quality standards. Further, AMSA believes that a water quality-based toxics control program should integrate toxicity tests in a manner that is not inconsistent with chemical specific permit requirements.

Effluent toxicity tests may be appropriate as reporting requirements in permit provisions. However, tests should not be used to monitor compliance with toxicity limits until their precision and procedural uncertainties have been quantified at a level equivalent to analytical chemistry protocols. This is a tool that is still under development, and something that should only be used in combination with specific constituent limits until refinements are made.

We support a reasoned approach to toxics control in which POTW dischargers are able to detect, confirm and resolve toxicity problems without being in violation of their permits. Applying EPA's pass/fail approach to toxics control will impede efforts to protect water quality.

AMSA believes that toxicity enforcement should only be initiated when a consistent pattern of unacceptable toxicity has been demonstrated, and the discharger has failed to control this toxicity in a reasonable and timely manner.

Lastly on the subject of toxics, all of us must recognize that toxics come from a wide array of sources -- residential, commercial and even natural sources. Efforts to control or ban products and practices detrimental to the environment could help improve water quality considerably.

With regard to funding. . .

AMSA is extremely concerned about the financial resources necessary to meet existing and future environmental mandates required by the Clean Water Act. We believe that it is absolutely essential that the Environmental Protection Agency be provided with sufficient resources, in both personnel and funding, to carry out its role with regard to these mandates in an efficient , sound and technically correct manner. If large-scale federal funding of wastewater treatment construction continues to decline, future solutions will lend themselves more to local flexibility, best management practices and local management approaches. It is imperative that good science help in our decision-making process.

We support full funding for the State Revolving Loan Fund (SRF) through 1994 and encourage fine-tuning of the Clean Water Act to streamline the SRF process so that it may be more effectively used to finance needed projects. We believe that the program's effectiveness has been stymied because of the widespread application of grant administration procedures to this loan program. Additionally, we note that many states are not acting on leverage options, thus limiting their ability to maximize the program's effectiveness.

We believe that Congress must acknowledge that clean water needs -- nationwide -- go beyond the State Revolving Loan Fund's ability to address. As a result, increasing pressure will be placed upon Congress to revisit the issue of what role federal support must take to assist communities in meeting the ambitious goals of the Act.

It is obvious that AMSA's concerns are substantial -- but just as substantial is our desire to work with you to effectively resolve the environmental challenges we, together, must face.

Again, Mr. Chairman, many thanks for this opportunity to speak with you and the members of your subcommittee. Now, Erwin, Ken and I are available to answer any questions you may have.

STATEMENT OF THE HONORABLE LEON E. PANETTA

BEFORE THE HOUSE SUBCOMMITTEE ON WATER RESOURCES

IN SUPPORT OF THE INCLUSION OF MORRO BAY, CALIFORNIA IN THE NATIONAL ESTUARY PROGRAM

March 21, 1990

Mr. Chairman and Members of the Subcommittee, I appreciate the the opportunity to appear before you today to discuss the reauthorization of the National Estuary Program under the Clean Water Act.

Last week, I introduced legislation, H.R. 4255, which would direct the Environmental Protection Agency (EPA) to give Morro Bay, California priority consideration for inclusion in the National Estuary Program. It is my hope to have this legislation included in the reauthorization of the National Estuary Program.

The National Estuary Program is ideally suited for solving the problems associated with the preservation of Morro Bay and I believe would greatly benefit from having Morro Bay included in the program.

The Morro Bay estuary contains the most significant wetland system of the central California coastline. Because of the Bay's interconnected ecosystems associated with its saltwater and freshwater wetlands, Morro Bay has an unusually diverse habitat. The Bay's intertidal areas support many threatened or endangered species of birds and marine mammals, including the harbor seal and the southern sea otter. Additionally, the estuary is host to a number of migratory bird species of the Pacific Flyway, which are to be protected by the United States as as part of the Pacific Flyway international treaty. All of these features combine to make Morro Bay an estuary of national significance.

Morro Bay is also of great economic importance to the local community and the nation as a whole. The sensitive estuary is an important breeding and nursing area for species vital to the area's commercial fishing industry. In addition to its thriving commercial and recreational fishing industry, the estuary supports many other industries which are dependent on the health of the Bay, such as tourism and mariculture. As one of the relatively intact natural estuaries along the Pacific coastline, Morro Bay attracts nearly 1.5 million visitors a year.

Despite the importance of Morro Bay to both the nation and the local community, its well-being is threatened by a variety of pollutants and fragmented management. Serious sedimentation, as well as significant amounts of urban run-off, are threatening the survival of the estuary.

Management of the Bay is currently divided among numerous governmental entities, none of which executes singular authority over the management and protection of the estuary. The variety of threats to the Bay and the fragmented management have made it difficult to develop a comprehensive approach to addressing the needs of the Bay.

As I mentioned earlier, the National Estuary Program is ideally suited for solving the problems associated with the preservation of the Morro Bay estuary. The National Estuary Program would bring together those agencies responsible for management of the Bay and help them develop a meaningful plan for long-term management of this important and sensitive estuary. Furthermore, the management plan developed for Morro Bay could serve as a model management plan for other threatened small estuaries along our nation's coastline.

It is my understanding that in order for new estuaries to be included in the National Estuary Program, the authorized level of appropriations must be raised when the program is reauthorized next year. In light of the success of this program, and the need for more estuaries, like Morro Bay, to be included in the National Estuary Program, I would encourage the Subcommittee to increase the program's funding to accommodate the inclusion of Morro Bay in the program.

Clearly, the Morro Bay estuary is worthy of inclusion in the National Estuary Program. The program offers Morro Bay a real chance to develop an approach which will ensure not only that the estuary survives, but that it flourishes. I would ask that the Subcommittee join me in this effort by supporting the adoption of my legislation to give priority consideration to Morro Bay for inclusion in the National Estuary Program during the Subcommittee's reauthorization of this important program.

Again, thank you for the opportunity to appear before you today.

STATEMENT OF
LAJUANA S. WILCHER
ASSISTANT ADMINISTRATOR, OFFICE OF WATER
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE SUBCOMMITTEE ON
WATER RESOURCES
OF THE
HOUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

March 21, 1990

Good morning Mr. Chairman. I am LaJuana Wilcher, Assistant Administrator for the Office of Water in the U.S. Environmental Protection Agency and I am pleased to appear before you today to discuss reauthorization of portions of the Federal Water Pollution Control Act, or the Clean Water Act as we commonly call it. Tomorrow my colleague Constantine Sidamon-Eristoff, Regional Administrator for Region II, will appear before you to discuss Lake Onondaga in New York State.

Many of the authorities and programs in the Clean Water Act which were reauthorized in the Water Quality Act of 1987 expire after fiscal year 1990 or 1991. On behalf of Administrator Reilly, I am requesting that the programs which I will shortly describe be extended through FY 1992.

The first area I want to address is the allotment formula of section 205(c) of the Clean Water Act, under which EPA allocates the Title II construction grant and Title VI capitalization grant appropriations among the States. This formula expires after fiscal year 1990 and we are recommending that the Congress act on both the allotment formula itself and on the Agency's authority to allot the Title VI funds which is provided in section 604(a). Devising a formula for allocating funds among the States is traditionally a Congressional prerogative. Accordingly, we do not intend to propose a specific formula. However, at the request of Congress we will be pleased to provide any necessary technical assistance to support this effort.

The following eight programs have expiring authorization levels in 1990 or 1991 for which we are requesting extensions. For those programs requiring fiscal year 1991 authorizations, we are recommending that they be reauthorized at the level contained in the 1991 President's budget request. For all of the programs we are recommending an authorization of "such sums as may be necessary for fiscal year 1992."

Sections 104(u)(1) and (2) of the Clean Water Act, which expire after fiscal year 1990, authorize us to continue surface water monitoring and operator training programs respectively. The monitoring program provides the basis of our knowledge about the health of our waters and is essential if we are to understand the extent of pollution problems and their causes, and identify needed controls. It also provides us with the means to measure success over time in cleaning up our waters. The operator training program will provide on-site compliance assistance to treatment plant operators in small communities, an area with special needs.

Grants to States to assist them in administering programs for the prevention, reduction, and elimination of water pollution, including enforcement, have been authorized under section 106 of the Clean Water Act since fiscal year 1973. These grants help our partner states carry out their many increasing responsibilities as Federal programs are delegated. This program expires after fiscal year 1990 and we recommend its extension as essential to continuing the state framework for addressing water pollution.

Funding for the Chesapeake Bay program, authorized under section 117(d), expires after fiscal year 1990. This program is successfully demonstrating what can be done to protect waters of special significance when Federal, State and local governments and concerned citizens join together. Continued funding for this program will help us continue to meet our expanded responsibilities under the Chesapeake Bay Agreement along with Maryland, Virginia, Pennsylvania, and the District of Columbia as well as provide valuable insights as we implement the National Estuaries program.

Under the Great Lakes program, EPA provides technical and management support for pollution prevention, control, and research activities in the Great Lakes. The early program emphasis was to eliminate eutrophication in the Lakes by reducing phosphorus pollution from point and nonpoint sources. Today, the program is increasingly focusing on the contamination of water, sediment, and biota due to persistent toxic substances. While addressing the problems of the Great Lakes, this program also provides an opportunity to test approaches for dealing with nonpoint, sediment, and other water quality problems that potentially can be used in other areas. Section 118(h) which authorizes the program expires after fiscal year 1991 and we recommend that the program be extended in FY 1992 at such sums as necessary to allow us to continue pursuing these newer directions.

EPA accomplishes much work through interagency agreements with the Army, the Departments of Agriculture and Interior, and other Federal agencies. Section 304(k) enables us to enter into agreements with and authorizes funds for EPA to use in obtaining help from these other Federal agencies in dealing with water quality problems. Currently, we are especially interested in working with our sister Federal agencies, particularly the Department of Agriculture given the close ties between agricultural practices and nonpoint source problems, in the implementation of nonpoint source management programs that States develop under section 319 of the Clean Water Act. We are also seeking increasing interagency efforts to protect wetlands. The funding authorization for these interagency agreements expires after fiscal year 1990 and we are recommending that it be extended to enable us to continue our interagency efforts.

Section 319 funding for grants to States to implement their EPA approved nonpoint source management programs was first appropriated for fiscal year 1990. Nonpoint sources of pollution, as you have heard before, now present the most predominant water pollution problem remaining before us. We are recommending that section 319(j), which authorizes funding through fiscal year 1991 for State nonpoint source grant funds, be extended to help States prevent and control their many nonpoint source problems.

The National Estuary program requires the development of basin-wide, comprehensive conservation and management plans for estuaries formally identified as being of national significance. The program has expanded from six initial projects to an expected 16 projects in fiscal year 1991 which will be in various phases of development. Section 320(i), authorizing funding for this program, expires after fiscal year 1991 and we are proposing that it be reauthorized in FY 1992 at such sums as necessary to enable us to continue supporting the development of management plans.

Section 517 provides a general authorization for EPA to carry out various activities for which no specific authorization exists. For example, this section provides us with funds to help develop effluent guidelines, implement the pretreatment program, maintain data systems, and essentially perform many of the ongoing activities associated with water pollution control. This authorization expires after fiscal year 1990 and we are recommending that it be extended to authorize us to do our daily business.

As you may know, Congress addressed this issue in the FY 1990 appropriations, and allowed FY 1990 SRF monies to be used for construction grants. That legislation, however, did not affect FY 1989 monies, which remain available through this fiscal year, and appropriations beyond FY 1990.

Thank you for the opportunity to present you with our list of recommended reauthorizations and changes to the Clean Water Act. I am happy to answer any questions that the Subcommittee may have.

Testimony of
The Honorable Geline B. Williams
Mayor of the City of Richmond, Virginia
& Chairman of the CSO Partnership
to the Water Resources Subcommittee
# of the Transportation & Public Works Committee
U.S. House of Representatives
Wednesday, March 21, 1990

Chairman Nowak, Members of the Subcommittee:

I am Geline Williams, Mayor of the City of Richmond, Virginia. I have the honor of serving as the Chairman of The CSO Partnership, a newly founded national organization dedicated to addressing the problem of combined sewer overflows in a practical and responsible manner.

Accompanying me are Craig DeRemer, Washington coordinator of the Partnership, Carmen Foster, Assistant to the Director of Public Utilities for the City of Richmond, Ron Bazarri and Monica Oakley, engineers for Greeley & Hansen.

The CSO Partnership was formed by local governments, sewerage agencies and utilities throughout the United States to provide a vehicle for developing and implementing practical solutions to the combined sewer overflow problem.

Combined sewer overflows, or "CSOs", as they are commonly called, exist in hundreds of localities throughout the United States where sanitary sewer systems and stormwater runoff systems are interconnected. The combined sanitary and stormwater runoff flows exceed the capacities of these systems during periods of rainfall resulting in untreated discharges to surface waters from CSO outfalls.

Before describing the CSO problem in more detail and the Partnership's approach for addressing the problem, I would like to take a few moments to tell you something about the CSO Partnership itself.

The Partnership's genesis was a meeting among cities facing CSO issues from across the United States during the December 1988 Annual Conference of National League of Cities. These localities realized that their CSO problems needed to be addressed, that the current law did not provide a framework for addressing the problem in a realistic and practical manner, and that the cost of the CSO control far exceeded the financial capabilities of most cities.

Interest in establishing our organization grew steadily in the months that followed as concerned local governments and representatives of sewerage authorities convened several meetings to share information and discuss possible strategies to address this crucial issue impacting the communities we serve. Recently, we incorporated our organization as a as a nonprofit, non-stock corporation and we have hired a coordinator to assist us in our efforts on Capitol Hill.

As you may know, there are over 1,100 communities in the United States with CSO problems. Several of these communities may be represented through a single jurisdiction or sewerage authority. We have been in contact with most of these communities, and I am pleased to report that over 170 localities and sewerage districts thus far have either joined or expressed interest in joining the Partnership.

We expect the Partnership's membership to continue to grow as more and more localities throughout the United States with CSO issues begin to realize the impossible regulatory burdens that they face with existing federal legislation and without grant funding.

The Partnership has and will continue to work closely with the National League of Cities. The League has adopted policies on CSOs that are consistent with goals, purposes, and policies of the Partnership.

Turning to the CSO problem itself, let me emphasize that local governments are not to "blame" for the existence of the CSO problem. The combined sewer systems that are the source of today's CSOs were installed many years ago to convey stormwater and sanitary wastes away from densely populated areas to protect public health.

As a general rule, wastewater treatment was not available at the time of installation of these combined systems. In many instances, combined systems were viewed as state of the art in wastewater technology. Now, however, these systems are a burden to these older cities. Unfortunately, these older cities also face a disproportionate share of the ever-increasing cost to provide necessary municipal services and to maintain aging infrastructures, in addition to shouldering the cost of CSO control.

Although there are still problems to be addressed, we have made great strides since the early 1970s in providing at least secondary treatment for municipal wastewater flows. As you know, that progress has not been without tremendous cost. In fact, the cost of providing secondary treatment throughout the United States has taken many more years and cost many more billions of dollars than originally envisioned by Congress when it passed the Clean Water Act in 1972.

The problems of achieving secondary treatment nationwide have been difficult and time consuming. However, these problems are pale in comparison to the magnitude of the problems facing individual localities with substantial CSOs. Local governments that have started addressing their CSOs have found the cost and technical complexity of the solutions overwhelming. These localities have already spent hundreds of millions in local dollars, only to find that hundreds of millions in additional dollars remain to be spent to fully address the problem.

For example, the City of Richmond has already spent or has committed to spend well over $100 million in local dollars on CSO control over the past 15 years, and needs to spend an additional $200 million in 1988 dollars to fully implement its CSO control plan. Additional millions of dollars will have to be spent each year to operate and maintain these CSO controls once they are fully implemented.

The capital cost alone to implement the city's plan equates to more than $1300 for each man, woman and child in the City of Richmond. Richmond simply does not have the financial resources to complete implementation of its plan with local funds.

Many localities throughout the United States face similar problems. These costs may tend to vary from one locality to the next, based on population, size, and other site-specific factors. For example, the cost of CSO control in the cities of San Francisco, New Bedford, Massachusetts, Rochester, New York, and Chicago, Illinois range from $1300 per person to $5000 per person.

By comparison, the cost of secondary treatment has generally been in the $50 to $60 range. In other words, the average CSO control cost is some 50 times greater than the cost of providing secondary treatment.

The combined costs for CSO control, providing necessary municipal services, maintaining aging infrastructures, as well as implementing other environmental programs, such as solid waste, drinking water, and conventional wastewater treatment, are staggering, and far exceed the financial resources of local governments. Local governments without CSO problems face difficult times already to meet the increasing costs for necessary municipal services, infrastructure needs, and environmental costs that they face in the years ahead. Without help from Congress, local governments with CSOs face impossible tasks with the added burden of their CSOs.

Federal and state grant funding will be critical to the successful implementation of effective CSO controls nationwide. Loans will not be sufficient because the costs of CSO controls are so great that repayment of the principal alone will exceed the financial capability of most local governments.

We want to emphasize that we are not suggesting the traditional construction grants approach to the funding of CSO controls where funds are awarded regardless of need. Rather, we are proposing a partnership between federal, state and local governments, where local governments spend to the limit of their financial capabilities for CSO controls and the federal and state governments provide the remainder of the money needed to complete the work.

The Partnership is in the process of preparing legislation to provide for federal grant funding on the basis of financial need and water quality benefit. In addition, the legislation will provide for a separate regulatory program for CSOs to take into consideration the unique problems presented by CSOs and the need to address CSOs on a site-specific, case-by-case basis. The legislation will provide for a reasoned, balanced approach to the problem that will facilitate the development and implementation of CSO controls nationwide in a responsible and practical manner.

We expect this legislation to be introduced shortly. We ask that this subcommittee give consideration of this legislation a high priority.

On behalf of the Partnership, I want to express my appreciation for the opportunity to appear before you today. We look forward to working with the subcommittee to address the CSO issue in a responsible manner. I will be happy to answer any questions you may have.

REAUTHORIZATION OF THE FEDERAL WATER POLLUTION CONTROL ACT

THURSDAY, MARCH 22, 1990

House of Representatives,
Subcommittee on Water Resources,
Committee on Public Works and Transportation,
Washington, DC.

The subcommittee met, pursuant to recess, at 10 a.m. in room 2167, Rayburn House Office Building, Hon. Henry J. Nowak (chairman of the subcommittee) presiding.

Mr. Nowak. The subcommittee will come to order.

This morning, the Subcommittee on Water Resources meets to continue its hearings on the reauthorization of the Federal Water Pollution Control Act.

The Federal Water Pollution Control Act was reauthorized and amended in 1987 with the enactment of the Water Quality Act of 1987 over the veto of then-President Ronald Reagan.

When the Federal Water Pollution Control Act was substantially rewritten in 1972, it established an expanded federal commitment to clean up our nation's waters.

Although Congress has had a role in water pollution control as far back as the 1800s, it was the Federal Water Pollution Control Act amendments of 1972 which provided the most comprehensive legislative response to water pollution problems to that time.

These amendments established the basic authority under which the program currently operates. The Act set a goal of fishable and swimmable waters by 1983 and the elimination of all pollutant discharges by 1985.

As we all know, these goals have not been met. Several of the Water Pollution Control Act programs' monetary authorizations are expiring at the end of this fiscal year, and several others expire at the end of fiscal year 1991.

At these hearings, we will explore issues related to the reauthorization of these programs, as well as receive testimony concerning other aspects of the Act.

With us today are several members of Congress and representatives of several groups with a keen interest in the Federal Water Pollution Control Program.

This afternoon, we will receive testimony concerning clean-up issues at Onondaga Lake, New York. Before we begin with our first witness, I yield to my distinguished colleague from California, Mr. Packard, for any opening remarks he wishes to make.

Mr. Packard. Thank you, Mr. Chairman.

I would like to begin by asking unanimous consent that we enter Arlan Stangeland's statement into the record.

Mr. NOWAK. Without objection, so ordered.

[Mr. Stangeland's prepared statement follows:]

STATEMENT OF HONORABLE ARLAN STANGELAND
CLEAN WATER ACT REAUTHORIZATION HEARING
WATER RESOURCES SUBCOMMITTEE
March 22, 1990

THANK YOU, MR. CHAIRMAN. TODAY THE SUBCOMMITTEE CONTINUES ITS HEARINGS ON CLEAN WATER ACT REAUTHORIZATION AND VARIOUS PROGRAMMATIC ISSUES AND SITE-SPECIFIC WATER QUALITY PROBLEMS.

YESTERDAY'S TESTIMONY FROM EPA, SEVERAL MEMBERS OF CONGRESS, AND ASSOCIATIONS WAS HELPFUL. COMBINED SEWER OVERFLOWS, STATE REVOLVING LOAN FUNDS, AND WATER QUALITY PROBLEMS AT SELECTED ESTUARIES DOMINATED MUCH OF THE DISCUSSION.

TODAY WE'LL HEAR FROM REPRESENTATIVES MARKEY, LOWERY, KAPTUR AND BLAZ AND VARIOUS ORGANIZATIONS ABOUT ADDITIONAL ISSUES. WE'LL ALSO LOOK IN DEPTH AT LAKE ONONDAGA'S (NY) WATER QUALITY PROBLEMS WITH TESTIMONY FROM SENATORS MOYNIHAN AND D'AMATO AND OTHERS.

MR. CHAIRMAN, I APPRECIATE YOUR WILLINGNESS TO HOLD THESE AND FUTURE HEARINGS ON THE CLEAN WATER ACT. I LOOK FORWARD TO WORKING WITH YOU OVER THE COMING MONTHS.

Mr. PACKARD. I offer my welcome to the members of the House that are visiting with us and will be testifying, Mr. Markey, Mr. Lowery, Ms. Kaptur, and Mr. Blaz.

We're very pleased that you're here, and we're looking forward to other organizations that will be testifying on the Clean Water Act.

I congratulate you, Mr. Chairman, on holding the hearing. Thank you.

Mr. NOWAK. Thank you.

We will move to our members list, and the first member I recognize is Congresswoman Marcy Kaptur from Ohio, and if you'd like to take the witness chair, we will incorporate your total remarks in the record, and you may proceed as you so desire.

TESTIMONY OF HON. MARCY KAPTUR, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO

Ms. KAPTUR. Thank you, Mr. Chairman, very much, and Mr. Packard. It's a pleasure to be here and appear before this committee again.

Today, I am going to talk to you about some problems we have in our region of the country. My district is both urban and rural, and this testimony concerns the difficulties that many of our rural communities have in dealing with their combined sewer overflow problems, more commonly known as CSO, which, I guess, you are all more than familiar with.

I wanted to talk to you about the difficulties that they are having in finding solutions to the sewer overflow problem as well as the funding situation that many of these communities face.

Now, we know that storm drainage is increasingly recognized as a very serious source of pollution because it's often contaminated with oil and rubber and lead from cars, other pollutants, certainly agricultural pesticides in the rural areas of our district.

Currently, the initiation of the State Water Pollution Control Revolving Fund or loan programs pose problems for small communities that really don't have the financial wherewithal to effectively repay the loans that they're being asked to pay.

Today, I just wanted to highlight one village in my district, called the Village of Delta, which has been constructing a waste water treatment plant that was partially funded through an EPA State grant.

Included in the pollution discharge permit for the grant for the treatment plant are stipulations that the village must correct the combined sewer overflow problem which exists in the village.

Generally, waste water treatment really wasn't available at the time of the installation of the combined systems, and this particular village has 12 combined sewer overflows, and both Ohio EPA and U.S. EPA have instructed the village to eliminate at least one of those.

EPA required that the overflow be eliminated as part of the waste water treatment plant grant. At the time that they were asked to do that, the village asked how it was supposed to finance this, and really there were no forthcoming suggestions from the state as to how to fund the CSO.

Now, the village has done a study of the contributing sewers to this particular overflow and determined that it would not be possible to just separate the storm water from the combined overflow in the one location, because there were too many sanitary lines running into the storm water lines throughout the village.

They will be completing their study for Ohio EPA by the end of April. The village figured out through its chief engineer that the most cost effective way for them to proceed would actually be to build a pond or lagoon to collect the overflow and then pump all of that into the waste water treatment plant, and they copied systems that were developed in the Philadelphia area and the Providence, Rhode Island, area.

But even in order to do this, they will need an additional half million dollars, and that's on top of the $1.2 million the village has already spent on the system.

Because of the phase out in the past of the Federal Government's grants programs, the only assistance left to them is through the state's loan fund.

The village share of the cost of the treatment plant comes out to about $1.15 million, and in order to pay for the project, sewer rates were raised in the village by 85 percent.

The average monthly combined water and sewer bill currently is about $38, and if the additional money is to be added onto this, the monthly bill for people out there would rise to a minimum of $58 a month, and in some parts of the country the combined sewer and water rates could rise as much as 300 percent due to the new loan program.

Now, this community is only a community of about 3,000 people, and I guess my major question and recommendation would be that I hope as you look at amendments to the Act that you might find a way to help some of these smaller communities bear the brunt of these very severely rising costs.

I understand that Geline Williams, the Mayor of Richmond and Chairman of the Combined Sewer Overflow Partnership, testified yesterday on how to deal with controlling combined sewer overflows in a cost effective manner, and they really do stress site specific controls and flexibility.

We certainly would support that in my area, and also I would like to suggest and ask the committee's favorable consideration of offering both Federal and state grant funding to ensure the implementation of effective control programs, because the cost of even repaying the loans exceeds the capability of these smaller communities.

So I would ask the committee's consideration of this request, and I understand that the partnership has prepared legislation which would provide for Federal grant funding on the basis of financial need and water quality benefit, and the legislation also provides a separate regulatory program for combined sewer overflows in order to address the site specific nature of solving many of these problems.

So, Mr. Chairman and members of the committee, I would hope that as you reauthorize the Federal Water Pollution Control Act that local communities, especially smaller ones like this one, might be kept in mind for additional Federal assistance, and I thank you for your attention.

Mr. NOWAK. Thank you very much for your statement.

Do you know if the State of Ohio is looking at this particular problem or trying to work with the community to alleviate some of those costs that you mentioned?

Ms. KAPTUR. They didn't really give them any suggestions. They just say that, you know, they're eligible for the loan program, but if they're eligible, their rates would go up as much as I have stated, so it's very costly, and the State loan program just isn't adequate.

So I guess why I'm here this morning saying maybe there's a way that the Federal Government could do more to work with the states in a partnership effort so they're not left out there all alone.

Mr. NOWAK. Well, as you know, we're still working on our secondary upgradings throughout the country, and we have to find a way to get broader participation if we're going to achieve that goal and also then look at combined sewer overflows.

The problem, of course, is going to be where those dollars come from and how those dollars can be shared. We will certainly be looking at the CSO Partnership's recommendations, because it will be a broad consensus of that program, and hopefully we can get cooperation from and form a consensus with the States and the local governments that are faced with these mandates to do something about the CSOs in addition to the secondary level of treatment.

But you know the budgetary situation, and the loan funds are certainly not going to even come close to the secondary needs that are out there, so we will have to find a way to cost share this and get the cooperation of the Administration as well as the States if we're able to provide a program that is going to have impacts on this area.

There are other impacts that are coming into the total load of pollutants into our waterways from the agricultural community and urban runoff, and if we don't get a total control, and I think that's what we're going to try to put together to see where the dollars can be spent to make the largest impact in the site specific communities that they're located in.

Your testimony certainly bolsters that kind of an approach, and we appreciate your testimony, and we'll be looking forward to working with you as we move forward.

Ms. KAPTUR. Thank you, Mr. Chairman.

Mr. NOWAK. Mr. Packard, do you have anything?

Mr. PACKARD. I have no questions, just thank you very much for your testimony. As the chairman said, all of this will be put into the package, and then we have to work with the funds as far as they can go. Thank you very much.

Ms. KAPTUR. As a member of the Budget Committee, I would just like to inquire as to whether the committee has sent any preliminary numbers to the Budget Committee that might relate to the proposal that you're developing.

We are just this week beginning to go over the initiatives that various committees have suggested.

Mr. NOWAK. Well, I guess the first request we've got is to authorize the present program at the authorization level. As you know, it's never been appropriated at that level, and we have to at least get that moved up so that we can, if we have new initiatives, have the start to use some of the authorized money that's already in existence.

We had Mr. Panetta, who has another problem at Morro Bay in California, testify yesterday, and we also stated to him that in order to reach new levels of activity, we're going to have to at least appropriate the money that is already authorized.

But we'll be back with all the members as we move forward to see if we can accommodate a broader impact program in the next, I'm sure, month and a half or so.

Ms. **Kaptur**. Mr. Chairman, though it isn't in my testimony, may I ask your permission here just to mention a situation in my own district, because I do represent an area that is both urban and rural, and we have a two percent slope in our area because we're right adjacent to Lake Erie, so we're very flat.

We used to be known as the Black Swamp, and then it was drained over the years for farmland and all of the rest——

Mr. **Nowak**. That was before you became the Congresswoman.

Ms. **Kaptur**. Yes, that all happened before my time, but I have found myself in a situation of looking, as the community has developed over the years, at more and more water.

Even the street that I live on looks like Venice most of the time, but what I've found as I've dealt with the programs coming out of the Clean Water Act, as well as the Agriculture Committee and many of the small watershed programs, is the real conflict that exists in the management of water between the rural and urban areas.

For example, one of my most rural counties, which is the largest hog producing county in America, was foresighted enough to clean all of its ditches, so then all the water came east right up against the major urban county, which has several large cities on the western edge, and you can literally go to some of the golf courses in this area when it rains, and you just see the water shooting across the streets and the land totally uncontrolled.

It's really very frightening to look at sometimes, and yet if you look at the authority that the local community has in order to try to deal with that situation, Ohio law, which may be unique, tries to get the county engineer to get all citizens to sign off on a water improvement project, a drainage project, for example, which is impossible.

When one citizen disagrees, an entire drainage project can be held up, and it has been very difficult in taking a look at the various types of authorizing legislation that exists to get cooperation between the rural community and the urban communities where they come together.

I don't know if that's something you can really deal with in this committee, but I know we have been looking at the Soil Conservation Service and the Small Watershed Act that is contained in the agricultural bill's authorization to try to see if we can't find a way through their loan programs to deal with some of the rural areas in the district.

But, essentially, the water ends up in the urban area that starts out in the other parts of the district, and yet there seems to be very little coordination for the sake of water across metropolitan areas.

Is there anything you are looking at that would somehow create cooperation between rural runoff and urban systems?

Mr. Nowak. We have, you know, tried to encourage, especially in the Great Lakes Basin, and that area that you're describing is in the Great Lakes Basin, to put together a broad management water protection kind of plan so that you can take one area and may solve its problem, but all they do is transfer that problem, in your case, too, to another set of homeowners, if you will.

When you look at that situation throughout the country, I'm finding that that is not unique because of the strong home rule kind of message, especially in the west, in trying to get large sectors to cooperate.

As we know, water is like the road system. It crosses all political boundaries, towns, villages, and ends up in the city's back yard, and we will, you know, try to further those kind of cooperative ventures.

But probably the feel of the committee is that we do not have a broad enough jurisdiction to obliterate the home rule that exists.

When you look at the political subdivisions of a state and the counties trying to cooperate with the state and the cities cooperating with the counties and the towns and the villages, you find almost a gridlock in trying to provide the overall benefit plan, because everybody looks at their own community in a rather selfish way, if you will, and yet it's what they declare in their best interest.

That may not be in the best interest of the neighbor, and I think the metropolitan type of governments that have grown up have looked at those area problems and have done a better job than the piecemeal approach by allowing strong, you know, home rule in every village and town, where you cannot cross jurisdictional borders and put a broad management plan together.

I know that's a problem, and we've discussed it with some of the state leaders, and it's very difficult to get movement, so we have to depend upon the type of good common sense that's out there.

In order to achieve that overall benefit, everybody has to give a little bit, and I don't know if we took away jurisdiction, as they say, rights that they have now, it would be very difficult to bring all the states under that same umbrella because of the variety of different kinds of home rule authorities that they have throughout the nation.

I hope that we could find some way to encourage the states to do that, because they have, of course, the jurisdiction over those counties and cities and towns, and I think that some type of incentive is the only way you're going to get broad encouragement for those separate jurisdictions to join in an overall plan.

I hope that the states, as they look at their water pollution problems and control problems, they could go a large way in solving those if you could get the political will to do it.

Ms. Kaptur. Mr. Chairman, I would be very supportive of any type of incentive that you might be able to incorporate in legislation to at least move them along those lines if they wanted to.

Mr. **Nowak**. Well, we're going to be working with the States, and we'll certainly keep you informed as to any progress we make.

Ms. **Kaptur**. Thank you.

Mr. **Nowak**. Thank you again.

[Ms. Kaptur's prepared statement appears on page 489.]

Mr. **Nowak**. We'll go to the top of our witness list. We have Congressman Edward Markey from Massachusetts. If he's here, we'll be happy to take your testimony.

Also, if Congressman Bill Lowery is here, he could join Mr. Markey at the table at this point in time, and also Congressman Ben Blaz, if he's here, the representative from Guam.

Please take a seat, and we'll have all your testimony presented, and then perhaps we could ask a few questions at that time.

We'll be happy to recognize our good friend from Massachusetts, Congressman Markey.

TESTIMONY OF HON. EDWARD J. MARKEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Mr. **Markey**. Thank you, Mr. Chairman, very much. I very much appreciate the opportunity that you're giving Bill Lowery and I to appear before you today to discuss the reauthorization of the Clean Water Act.

We are here, Mr. Lowery and I, as the co-chairmen of the Congressional Caucus for Clean Water, a group of 47 members of Congress concerned about water quality issues.

We are happy to count amongst our members six members of this subcommittee. Our common cause is to ensure that the Federal Government follows through on its responsibility to our citizens by supporting the states, cities and towns as they struggle to meet our nation's clean water goals and commitments.

In 1988, and again in 1989, when the public was polled as to whether the quality of the environment was better or worse than five years previously, the majority of Americans said that it was getting worse.

This followed a decade of public optimism about environmental quality. Many Americans are now becoming convinced that the threat of environmental decline is as dangerous as any other threat that we face.

For Congress, the 1990s promises to be the decade of the environment as we take account of our world's precarious state and recommit ourselves to improving it.

This year, Congress is focusing on the Clean Air Act, with the goal of improving air quality and abating acid rain. In focusing on clean air, we must not lose sight of the commitment that we made to clean water in the 1987 Clean Water Act.

Like clean air, clean water is a basic human right. Unlike cleaning up the air, however, cleaning up our water demands considerable federal expenditures.

In 1987, our near unanimous override of President Reagan's veto of the Water Quality Act recognized the enormous need for action on clean water.

At that time, we set specific and comprehensive standards, goals and requirements for States to follow. Two years ago, the EPA prepared the 1988 Needs Survey Report, which detailed the capital costs needed to build the publicly owned municipal waste water treatment facilities required by the Clean Water Act.

According to this report, $83.5 billion is needed to satisfy all categories of need in the Act. As the members of the subcommittee know, waste water treatment problems are not unique to particular States or to metropolitan areas.

The need in each of 22 States exceeds $1 billion apiece. New York, for example, faces over $12 billion to comply, while Florida, California, and my own State of Massachusetts require over $5 billion each.

Very few states are spared; in all but four the need is greater than $100 million. If the Federal Government abandons its obligation, as is happening in so many other areas, state and local governments will have to swallow a poisonous concoction of increased taxes and rate shock if they are to avoid non-compliance.

In too many cases, they may just refuse to swallow it at all by simply not complying with these federally imposed environmental requirements.

It is hypocritical for the Federal Government to impose Federal demands but provide no federal dollars to meet the imposed requirements.

We must at least be prepared to share the burden we have placed on the States. I commend the chairman for his hard work and his dedication to his issue, and the Clean Water Caucus looks forward to working with him and the other members of the subcommittee.

Mr. Lowery and I are working together to demonstrate the bipartisan and bicoastal nature of these issues. We think it only makes sense to look at these issues in a non-ideological fashion, since they are pragmatic problems that each community in the country is faced with, and we think that the Federal Government should play a role in helping to solve them.

I thank you, Mr. Chairman, very much for the opportunity to testify today.

Mr. NOWAK. Thank you very much.

Mr. Lowery.

TESTIMONY OF HON. BILL LOWERY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. LOWERY. Thank you, Mr. Chairman, Mr. Packard. I appreciate the opportunity to appear before the panel today with my colleague from Massachusetts, Congressman Markey.

As Ed mentioned, we do serve as Chairmen of the Congressional Caucus for Clean Water, and I concur with my colleague that the burden must be shared.

As we all know, burden sharing is a current buzz word in Washington. We want our allies to share the burden of defense, our old foes want to become new allies and would like us share in the burden of creating democracies, but here at home we have a failing infrastructure and polluted air and water that also demand burden sharing.

The Federal Government has not shied away from sharing this task in the past. Since 1972, EPA has provided more than $45 billion in construction grants nationwide, in some instances covering up to 75 percent of the costs.

Support exists for Federal financial involvement in these programs. The Caucus for Clean Water had more than 80 people sign a letter to the Chairman of the Budget Committee urging full funding for the $2.4 billion authorized for the State Revolving Loan Fund Program.

Everyone seems to be fully cognizant of the dangers to our environment, and more and more americans are willing to cooperate to save the quality of life so important to us all.

President Bush has called for a program entitled America the Beautiful in which he wants to plant a billion trees. Do we water those billion trees from sewage tainted water sources?

We keep legislating our fears by requiring more and more stringent guidelines to achieve clean and water, yet we're abandoning our commitment to the financial burden of those guidelines.

Cleaning America is going to be an ongoing challenge but one we must share. States and communities faced with declining dollars from Washington are ill-prepared to meet the millions of dollars in demands for advanced treatment systems.

As Congressman Markey has made clear, the EPA Needs Survey indicated the cost to States and localities to comply with the federal mandates are prohibitive, over $100 billion.

Mr. Chairman, the States and local communities want clean water as much as the Congress, and they intend to do everything in their power to achieve the goals set for them, but they need help.

The Federal Government needs to seriously assess its future role and financial commitment, and let me put emphasis upon financial commitment, to these programs.

I know with these hearings on the reauthorization of the Federal Water Pollution Control Act that you are indeed assessing the federal role and the financial commitment to clean water in America.

Chairman Nowak and Mr. Packard, I thank you very much.

Mr. **Nowak**. Thank you.

Because of the joint nature of your testimony, we'll break in and just ask a few questions. The committee certainly appreciates your co-chairmanship of the Congressional Caucus for Clean Water because it gives us a broader kind of input into the budget process initially, and certainly gives us a broader platform from which to start to discuss changes in the act and I think makes members aware that we've got this issue, and it's going to become another federalization program, if you will.

Either these costs are going to be assumed by the states and the local governments or, as you rightly pointed out in your testimony, we're going to have a broader federal role.

Certainly, the first step in this process is to at least appropriate the dollars that we have available of $2.4 billion instead of $1.6 billion, and even those dollars, when you look at the need studies that you've mentioned, of course, don't come close to where we'll have to be.

Then we're hearing from all kinds of communities about the CSO problem, and that's going to be on top of our secondary treatment upgrading in the country.

It cannot be accomplished without tremendous increases at the local level, and we'll try to devise a way through what's called the CSO Partnership to put a program together with incentives so that we can get the Federal and state and the localities to find, first of all, the most cost effective way to solve those CSO problems and see what the water quality impact will be and try to prioritize some movement in that area so that we can once again bring about a program that at least gives us an opportunity to reach our goal of swimmable and fishable waters, which, of course, we've long passed.

These problems don't get any better as you have more development, especially in urban areas, and more farm communities are going to get more pollution, and we're not catching up to that problem.

But we appreciate your testimony, and let me turn now to Mr. Packard for any questions he may have.

Mr. **Packard**. I have no questions, simply to commend you on your leadership in developing a national approach to the clean water issue and making a broad-based input into our deliberations.

We appreciate it very much, and we appreciate your testimony.

Mr. **Lowery**. Mr. Chairman, if I might just respond for a second, when Marcy Kaptur testified you mentioned states' rights, and obviously they're quite important.

But it seems here we have a situation where the Federal Government is mandating standards and yet providing very little by way of the resources necessary to achieve those standards.

That, obviously, treads upon states' rights and local control. We're not arguing with the need for Federal standards, by any means.

If we're going to clean up our water and our air, this is where the leadership has to come from. But, correspondingly, we have the responsibility to do our fair share in meeting the resources to achieve those goals.

Mr. **Nowak**. I think that's absolutely right, and I hope that we can get our governors and our states and the administration behind an incentive bill that will make a substantial difference and better be able to achieve everybody's goal.

Everybody wants clean water. Every state governor does, and every local official does.

Mr. **Lowery**. Nobody wants to pay for it.

Mr. **Nowak**. But the problem is that every level of government looks to the next, and in the recent history of the act, of course, more and more emphasis is put on local funding.

As you say, we don't want the local communities walking away because they can't talk to the states about participation, and they won't move the kinds of dollars into the ineligible categories, which is CSOs at the present time.

States won't, you know, move enough out of the 20 percent discretionary set-aside to satisfy those needs, so I'm afraid we're going to come to a gridlock on this unless we can, with your help, put together a program that is agreed upon, and we can move through this House, and, of course, we'll have to work with the Senate as well.

Mr. LOWERY. We want to work with you any way we can.

Mr. NOWAK. Thank you very much. Thank you for coming.

[Mr. Markey's prepared statement appears on page 502.]

[Mr. Lowery's prepared statement appears on page 500.]

Mr. NOWAK. We now turn to Congressman Ben Blaz from Guam.

TESTIMONY OF HON. BEN BLAZ, A DELEGATE IN CONGRESS FROM THE TERRITORY OF GUAM

Mr. BLAZ. Thank you very much, Mr. Chairman. I appreciate the opportunity to be here. I have a statement I'd like to submit for the record, and I'll just highlight at this point.

Mr. NOWAK. Without objection, so ordered.

Mr. BLAZ. You know, Mr. Chairman, you have heard the concerns of the members of the Congress from the various States of the Union, and today I come before you to broach a special concern of the non-union members, those of us on the periphery of the republic, the territories who are required by law to observe the same rules and regulations but whose structure of government, as well as economy, just do not lend themselves to the kind of requirements that we have.

I have in mind in particular the requirement that the States and Territories would erect a State Revolving Fund Program.

This requirement, Mr. Chairman, is very impractical for Guam because we don't have a multi-layered government. The Government of Guam is one, and the next thing you do is turn on the faucet.

There's nothing in between. So, consequently, it would be extremely difficult for us to get involved in a situation where we would kind of tax ourselves.

Besides, we have a law that may make it inorganic for us to do what is required in this act. So I'm here to ask you if you would all seriously consider an amendment that I am proposing that would exempt the Territories, and in particular my Territory, from the idea of the State Revolving Fund so that we could just be treated as construction grants.

We understand that this fund is already in EPA; EPA goes along with what we're trying to do. And we're also in a position to continue our own effort after 1994, so everything seems to be on track.

But I need to make this appearance before you to make this request. Now, this same request was entertained two years ago, and it was passed by the House and only fell out when there was some disagreement with the Senate on an unrelated matter.

It had to do with something unrelated to this, and it fell out. So my purpose again, Mr. Chairman, is to say to you that if there's any way that we could have this amendment of mine approved, I would appreciate it very much.

It means $619,000 this year for us, which EPA, I understand, holds and can let loose if we approve this. And also it means $5.3 million for us through the next two years.

When I come to the Congress and I speak of Guam, and people aside from asking me where it is and why are we concerned, the problem that I have is convincing the Congress that the interest of the people of Guam is the interest of the United States in that part of the world.

Everyone is visiting us lately, Mr. Chairman, because of where we are, and I dare say that had Guam not been there, we would have probably asked the Corps of Engineers to rent an island and put it exactly where it is, because we need it right there.

So anything that we can do for Guam with the federal funding I think would be in the best interest of the United States, considering all of the things that we're looking at in the foreseeable future.

So that concludes my summary, Mr. Chairman. If you have any questions, I'd be delighted to answer them.

Mr. Nowak. Thank you very much. I think you make a good point in speaking about the uniqueness of the territories, and especially Guam, and I think we have to find a way to put you back into business, so to speak, and we will find a way to work with you as we draw up this bill.

Thank you for bringing this to our attention, and we will be back as we develop an adequate type of response for your consideration.

Mr. Blaz. Thank you, sir.

Mr. Nowak. Let me turn to Mr. Packard.

Mr. Packard. Mr. Blaz, you say you intend then to submit the amendment again?

Mr. Blaz. Yes, I do.

Mr. Packard. Will that be before the committee or on the floor of the House?

Mr. Blaz. Right here before the committee. I believe I'm already working with the staff on it, sir.

Mr. Packard. That will be the time, of course, for us to entertain and discuss the issue. Thank you very, very much.

Mr. Blaz. Thank you.

Mr. Nowak. Thank you for your appearance.

[Mr. Blaz' prepared statement appears on page 444.]

Mr. Nowak. We will proceed now out of order, but we'll have an opportunity here for Congressman Bates at a later time.

He's not presently available, so we will move down the agenda to the Water Pollution Control Federation, represented by Dr. Ira L. Whitman, who is president of The Whitman Companies, Inc..

Along with Dr. Whitman, we also have, from the Research Foundation of the Water Pollution Control Federation, H. Gerard Schwartz, Jr., who is Chairman, and if he would like to come to the table at the same time, we will panelize the witnesses and then be able to ask questions of the whole panel.

Mr. Schwartz will be accompanied by Mr. Glenn Reinhardt, who is Executive Director, Water Pollution Control Federation, along with Billy Turner, who is President of the Columbus Waterworks.

Gentlemen, we appreciate your presence, and, Dr. Whitman, if you'd like to start your statement, we will then move to the others.

TESTIMONY OF IRA L. WHITMAN, PRESIDENT, THE WHITMAN COMPANIES, INC., ON BEHALF OF WATER POLLUTION CONTROL FEDERATION

Mr. WHITMAN. Good morning, and thank you on behalf of the Water Pollution Control Federation for the opportunity to be with you today.

I'm here as Chairman of the Government Affairs Committee of the Water Pollution Control Federation, which is a non-profit technical and educational organization devoted to professional leadership in the preservation and enhancement of water quality.

The federation was founded in 1928, and we have 40,000 members, who include civil and environmental engineers, waste water treatment plant operators, scientists, managers, and others working in State and local government, federal agencies, industry, academia, and the private sector.

Our members are actively involved in implementing clean water laws and regulations, and we're the ones who make the new legislation work just as we've made the previous legislation work.

I would like to say on behalf of my colleagues in the Federation that really we are a unique organization in the country, because we represent the body of expertise in the field that are in the practice and involved heavily in the implementation and the programs under water pollution control, and we appear before you to offer that expertise and to represent the professions practicing in this field.

My own experience extends from the public sector, where I was Administrator of the State of Ohio EPA during the 1970s, to the private sector, where my company currently consults on many water and hazardous waste problems.

As an aside, most of us in the Federation who are professionals in this field have a deep personal involvement and commitment with the Clean Water Act and the various amendments that have come through since 1972.

In my own case, it happened that the very week that I was sworn in as the Director of the State of Ohio EPA was the week that the Clean Water Act was first passed.

The revolution that was that act became a revolution to all of us in State government in administering that act, and all of us in private practice and the engineering professions and in the operations of treatment facilities, because from that day forward our professional lives have really been changed and, in many ways, upgraded by the demands and requirements of that act.

We certainly commend you to consider carefully the needs of the nation and the needs of the water quality interests as you proceed with new amendments to the Act.

By all accounts, water quality in this country has improved vastly over the past two decades since the 1972 Clean Water Act.

Over 88 percent of the nation's waste water treatment facilities now provide the equivalent of secondary treatment, and, as we know, many of our rivers and lakes are substantially cleaner than they were two decades ago.

We believe that the new legislation must ensure that adequate resources are provided and that appropriate mechanisms are in place to deal with the current and future water quality needs.

We have outlined seven issues which we believe should be given priority in the next round of Clean Water Act amendments.

These issues are: funding, flexibility, sludge management, combined sewer overflows, non-point sources, wetlands, and professional education and training.

Though the written testimony deals in depth with all of these issues, I will skim over some of those and go through them and touch on the highlights.

But it's important for you to realize that we at the Water Pollution Control Federation, with over 50 committees and 40,000 members, are actively working both technically and on policies related to all of these issues and would be very pleased to provide you with additional information and to work with your staff on any or all of these issues as you consider them in the future of the legislation.

With regard to funding, we all know that waste water treatment has received significant Federal funding since 1972. We know that there are other serious infrastructure needs in this country, and we also know that the needs of waste water treatment and water pollution, many of these continue to go unfulfilled and that there is still a large demand for Federal funds in these areas.

We recognized in the early 1980s that the responsibility for funding waste water treatment plant construction needs to be transferred from the Federal Government to State and local government.

We have supported a smooth transition, and we have the concept of the State Revolving Fund, and we would hope that you would be able to make it possible, through the new legislation, to achieve the goals of the State Revolving Fund, which are to allow municipalities to acquire loans from State government for the construction water pollution control facilities, and then to pay back those loans, allowing those funds to be used for other municipalities.

This program, as you know, has not been implemented as quickly as first hoped, and it remains to be seen whether it will be successful.

There have been restrictions and regulations and, in many cases, red tape put on the ability of the states and the municipalities to participate in this program, and we hope that in the future the program will be developed and outlined in a way that the State Revolving Fund concept can be fully implemented.

Even if the State Revolving Fund is completely successful, there is growing concern among the membership that the funds themselves will not be fully sufficient to finance the cost of complying with all of the regulations and all of the needs.

We are proposing for your consideration three other funding mechanisms for the construction of water pollution facilities.

These include the use of user fees, privatization for facilities where privatization is economically feasible in those communities, particularly small and medium-sized, growing communities, and also the use of tax exempt bonds for the funding of water pollution control facilities.

Again, I won't present all of the detail, but we are available to provide the information that we have to you, should you desire that.

We believe that there's no one single solution to all of the waste water funding needs. The best course of action will be in promoting some combination of State Revolving Funds, municipal bonds, privatization and user fees.

However, the cost of complying with regulations issued by the Federal Government eventually may need to be met with renewed federal funds.

The second issue which we as professionals feel very strongly about is regulatory flexibility. We believe there is a strong need to build more flexibility into the statutory requirements of the Clean Water Act.

When properly utilized, flexibility and regulatory discretion allow for greater achievement of water quality goals.

We believe that EPA must be allowed to fully utilize its professional scientific staff to make decisions which will improve water quality.

We believe that water quality regulations should be based on water quality standards, technological standards based on the best available scientific information, and upon a realistic health-based approach.

Lack of flexibility limits the options available for meeting the law, even when the options can make a substantially greater contribution.

I think that you may want to look at the regulatory environment in the following way. In the past two decades, we've tackled with federal funding, with increased regulation, many of the easier problems in solving our water pollution control and water quality problems.

Construction of sewage treatment plants, the regulation of industrial discharges, have in many ways been the easier aspects of achieving improvements in water quality.

Now we are faced with some of the more difficult aspects; storm water flows, combined sewer overflows, agricultural runoff, and many of these approaches do not lend themselves as easily to a prescribed rigid regulatory system.

We believe that discretion and flexibility on the part of EPA and on the ability of the professionals in the field to develop solutions in these areas will be very important in order to achieve the same level of success with these new areas of control over the next two decades, as we have had over the last two decades, with the construction of municipal facilities and the regulation of industrial discharges.

The next issue I'd like to call your attention to is that of sludge management. WPCF believes that EPA's proposed sludge regulations mandated by section 405 of the Clean Water Act are seriously flawed.

Prior to their issuance in September 1989, WPCF met with officials from EPA to express this concern. Although EPA Administrator Lee Thomas decided to go forward with publishing the proposed rule, he did agree to an unusually long comment period.

He also mandated that the proposed regulations be analyzed by a scientific peer review panel during this period. WPCF, along with the Association of Metropolitan Sewage Agencies, AMSA, and others, subsequently helped to fund this peer review group to analyze the draft proposal.

The peer review group found EPA's sludge proposal to be based on inaccurate scientific data. The panel also indicated that if issued in current form, the beneficial use of sludge would be greatly restricted.

The panel further said that EPA itself lacked the scientific capability to produce a sound sludge disposal regulation and strongly recommended that EPA accept outside scientific assistance.

We have been working with EPA on these issues since that point, and a member of our organization testified before this subcommittee last year on the issue of sludge management, and we would be more than pleased to assist your subcommittee and your staff on the technical issues in sludge management.

We believe that they're very important to the future of water pollution control. The criteria for evaluating the adequacy of sludge for beneficial uses must be based on good scientific data and a reasonable health risk model.

We also believe that a peer review process, which worked so well in the case of sludge management, should be statutorily encouraged in other regulatory initiatives and should occur before proposed regulations are issued.

The next issue I'll touch on is combined sewer overflows, and I know that you've had testimony yesterday on this issue and some discussion today.

I would like to call your attention to the fact that the Water Pollution Control Federation is in the process of reviewing the EPA guidance on this issue, and we are conducting a major technical conference on this issue early in April.

If perhaps committee staff members would like to attend this meeting, we would be more than pleased to help you make the arrangements and to provide the information.

We agree that combined sewer overflows are a problem that cannot necessarily be treated in exactly the same manner in every location and that it's particularly important to many of the older cities that face the enormous problem of dealing with these overflow discharges.

Likewise, non-point sources will become and are becoming important elements in overall water quality management and control.

Emphasis needs to be given to instituting incentives and management practices aimed at substantially reducing contaminated runoff from agriculture, mining and other activities.

These rural non-point sources are having an adverse impact on water quality, especially on ground water aquifers, and, as you know, ground water supplies the vast majority of water used in rural areas, and once contaminated is very, very difficult to clean up and to improve.

Unless rural non-point sources are identified and controlled, the gains made in urban areas may be negated. You heard earlier Congresswoman Kaptur talking about her district, where the interplay between the rural discharges and the urban areas are causing problems.

This is not unique to that area. This is a common problem throughout the country, and we believe that it's important for you to recognize that perhaps new regulatory regimes for controlling these substances at this time are premature, since in every case the exact nature and extent of the problem will vary from location to location.

We strongly support full funding for this program, which has been severely underfunded in the past. Section 319 of the act, in our judgment, needs to be strongly emphasized as a priority program in the next Clean Water Act amendments.

On the subject of wetlands, we believe that the planned revisions to Federal wetlands policy should take into account the effect of wetlands on waste water management.

We have to recognize that most waste water treatment facilities originally were built in wetlands, and the expansions required for these facilities will likely take place in wetlands.

We also must recognize that wetlands themselves can be useful for waste water treatment, and the use of the wetlands should be encouraged.

Engineers and scientists are now really for the first time only realizing the vast potential which the wetlands hold for treating waste water under site specific circumstances.

Finally, I'd like to touch on what we believe is a problem, and that is the problem of professional education and training in the water pollution control field.

We believe that no issue is more important to the future of our ability to manage waste water than education and training.

Our educational system throughout this country at this time lacks the process to nurture young children with aptitudes and interest in science and math, and we are feeling that lack today in the field.

The direct result of this is a declining interest among young adults in pursuing education and careers in science and engineering.

If this trend continues, we fear there will be a lack of trained professionals in the water pollution control field. We also feel that we must educate the public on the need for sound environmental processes and programs at all levels of society and that, in fact, the role of scientists, engineers and policy makers in managing the environment is extremely important and that the technically trained and scientifically trained people play a vital part in our success in managing water pollution and water pollution control.

We would hope that Congress would recognize in all future environmental legislation the role of the Federal Government in assuring adequate scientific and professional training so that the environmental programs mandated by law can succeed.

On a personal note, I would tell you that I was educated in part in my graduate education with a Master's degree funded by grants from the Public Health Service and a Doctoral degree funded by grants from the Public Health Service and from the Water Quality Administration, I believe it was called, which was the predecessor agency to EPA.

You will find that many of the persons in positions of management and policy making today who are in my age group, their 40's and 50's and perhaps their 60's, were trained in large part by funds made available by the Federal Government.

I believe, and most of us believe, that the benefits of this training have been repaid many times over back to the country and back to the Federal Government in terms of creating the leadership and the management ability in order to carry out these complex programs.

We would like to call your attention to our concerns that there is not at the present time adequate renewal of the human resource within the field and that the Federal Government and your subcommittee should consider the importance of training a new generation of professionals in our field.

To summarize, we have come a long way in abating point source discharges of water pollution, and we need to find ways to protect the substantial investment that we have already made.

We're now faced with new challenges, such as controlling combined sewer overflow, storm water, agricultural runoff. The technological know-how and regulatory programs which rely on sound health assessment models and flexibility for achieving State goals must be developed to meet these challenges.

We must also find ways to pay for future improvements, realizing that State and local governments have limited resources.

The Water Pollution Control Federation, as the body of professional knowledge and expertise in this field, is eager to work with you in developing solutions to the nation's water quality problems through the Clean Water Act and other legislation.

The preceding testimony represents a consensus of issues which should be addressed, and WPCF is currently working to develop federation-wide positions on all of these issues and more.

We will be happy to provide members of the subcommittee with any future statements on the Clean Water Act which the Federation develops, and to meet with members of your staff to share our ideas with your staff.

As the National organization of water pollution control professionals, we offer our technical expertise to you as a resource on which to base sound federal water pollution legislation and policy.

We believe that it is better to develop and implement good legislation and regulations to begin with than to try retroactively to correct bad ones.

We look forward to working with the subcommittee in the future on these issues, just as we are now working with EPA. This concludes my testimony, and Dr. Schwartz is here on behalf of the Research Institute of the Water Pollution Control Federation. Thank you very much.

Mr. Nowak. Thank you.

Dr. Schwartz, would you like to present your testimony?

TESTIMONY OF H. GERARD SCHWARTZ, CHAIRMAN, WATER POLLUTION CONTROL FEDERATION RESEARCH FOUNDATION

Mr. SCHWARTZ. Thank you, Mr. Chairman, Mr. Hancock, Mr. Costello. It's nice to see some familiar faces from my part of the country.

I'm President of Sverdrup Environmental, an environmental engineering company in St. Louis, but I'm here today as Chairman of the Board of the Water Pollution Control Federation Research Foundation, and I'll refer to that as the WPCF Research Foundation throughout my testimony.

With me today is fellow Foundation Board member Billy Turner from Columbus, Georgia, and our Foundation Director, Glenn Reinhardt.

You've heard from our parent organization, the Water Pollution Control Federation. What I'd like to talk to you today about is the Research Foundation, a new idea, a new approach, and to solicit your support for that approach to research and development in the water pollution control field.

We're talking really about a public-private partnership to develop a research foundation to address the growing and continuing to grow needs in the water pollution field.

Some years ago, the federation became concerned about what it perceived to be some long term trends in waste water research and development.

Let me be a little more specific. Federal funds were being shifted from waste water research to other media, hazardous waste, land, air.

Specific funding for what I might term practical technological research on waste water processes and technologies, the funding for that has dropped from $15.6 million to less than a half million dollars over the last 12 years.

Waste water research is increasingly regulatory based, rather than directed toward the development of new and enhanced processes and technologies.

America is losing its competitive edge in the world markets for waste water treatment technologies. Fifteen to twenty years ago, the United States was at the forefront of the development of new waste water treatment systems, largely through the efforts funded intramurally and extramurally of the Taft Center in Cincinnati, now the EPA Research Center.

Today, I would say that most of the new developments that we use in the waste water business are coming from abroad from Japan and Europe.

Finally, the Federal Government's and the nation's $50 billion investment, federal investment as well as the probably equal amount from local and state sources, in waste water treatment facilities needs to be protected.

So with these and other factors in mind, the Water Pollution Control Federation carefully crafted the Research Foundation to allow the industry itself to create its own research arm.

The U.S. Environmental Protection Agency's current waste water research and development budget is focused on regulatory issues, rather than on technology and process development.

This means that while EPA is developing more sophisticated techniques to measure pollutants and to regulate industry and municipalities, both industry and municipal utilities lack the resources individually to develop the sophisticated technologies necessary to meet these regulations.

Let me be more specific to some of the problems the industry and municipalities face. Better, more cost effective treatment systems to handle nutrients, to handle toxics, and to achieve the higher levels of conventional pollutant removals that are being required.

How to manage an aging infrastructure system and premature deterioration of facilities with an increasing demand of a growing population.

How to develop processes and technologies to treat the thousands or tens of thousands of new exotic chemicals that exist in our society and are being introduced annually.

Toxics, this whole issue of toxics in the air, in the water and on the land. What's the fate of the toxics that even you and I put into the sewer system in our homes and industry as well discharge to the sewers of our cities?

We really don't know what happens to them. How do we meet the more restrictive discharge standards for treatment facilities?

How do we encourage and achieve more and better water reclamation and reuse, especially in the arid southwest, but other parts of the country as well?

How do we safely dispose of the millions upon millions of tons of sludge generated on a daily basis? How do we safely use sludge and apply it to land to enhance agricultural production?

These are only a few of the critical problems that are facing the waste water industry? Attached to our written testimony is a list of research needs that we've identified and that municipalities and industry are being called upon to solve.

Any one of these research needs, whether it's sludge disposal, toxics, water quality effects, volatile air emissions from treatment plants or others, requires substantial investment.

It's clear that the resources of a single community or company are easily exhausted when trying to act independently to develop the necessary technologies, and until now the only option has been more or less to go it alone.

The WPCF Research Foundation is building a consortium of interested parties to address the growing research needs of the water pollution control industry.

It's modeled after other successful industry sponsored research efforts, such as the Electric Power Research Institute established in the early 1970s, the Gas Research Institute, and the American Waterworks Association's Research Foundation.

We're creating a subscription based funding mechanism to support practical, applied research identified by the industry, and that means all segments of the industry, for the industry.

The subscription mechanism will involve municipal waste water treatment plants, consultants, waste water equipment manufacturers, discharging industries, State and Federal Governments, and others.

Since our incorporation in April of last year, we're just about one year old, we've received broad support from the industry.

Acting on behalf of the industry, the Foundation has proceeded at a remarkable pace to build a viable research entity to rejuvenate the sizable effort that was once in the federal domain, but we really need your help.

The Foundation is proposing to Congress a new cooperative cost sharing partnership between the waste water industry and EPA in support of waste water research and development.

The foundation is seeking $2.5 million per year for three years, beginning in fiscal year 1991. We seek this authorization to establish a program providing a match, a one to one match with the federal funds and funds from the industry itself.

We propose an administrative mechanism to be set up between EPA and the industry to determine the research needs and select projects that are of mutual interest and need.

This cooperative effort, at the least, will double the federal investment and in the long term have a many-fold return to our country.

It will provide a practical focus for waste water research and, in essence, provide the jump start that we need to get this foundation off the ground.

There's another attachment which shows our 1990 research agenda which is fully funded by the waste water industry itself.

We've begun by setting projects, which we call agenda setting assessments, in five major areas, such as sludge, fate and reduction of toxics, volatile organics.

These have been selected by a consensus of the waste water industry, and the intent here is to explore the state of research, the state of technologies, and to identify the gaps such that specific research projects can then be identified budgets adopted for fiscal year 1991 and beyond.

Our ability to meaningfully fund any of those projects in 1991 and beyond will be determined by this subcommittee's support for our request of the $2.5 million cooperative grant as an add-on to EPA's fiscal budget.

The long term results will be protection of the Federal Government's $50 billion investment in waste water treatment plants and at least that much from local and State governments as well; economically feasible, more cost effective alternatives to pollution abatement processes, better processes; restoring America to a leadership position in competitiveness with other nations in innovative and cost effective pollution control technologies; and, of course, continuing to protect and enhance our nation's waters.

I would like to yield at this time to Billy Turner, who will provide a municipal perspective on the role of this foundation in the waste water industry.

After Mr. Turner's brief statement, we'd be happy to entertain your questions.

TESTIMONY OF BILLY TURNER, PRESIDENT, COLUMBUS WATERWORKS

Mr. **Turner**. Chairman Nowak and fellow congressmen, thank you for this opportunity to discuss the important issue of clean water.

I am Billy Turner, President of the Columbus Waterworks. I'm from the talking proud city of Columbus, Georgia, most known for its close proximity to Fort Benning, home of our country's infantry and the School of the Americas, which is helping to bring peace and stability to our world.

My agency is responsible for both waste water treatment and drinking water for approximately 200,000 people in the consolidated city/county government of Columbus.

This past Sunday, I had the unhappy and disconcerting experience of riding over the top of our 35 million gallon, $40 million waste water treatment in a boat as the Chattahoochee River rose about 30 feet in 48 hours.

I'm very pleased to say, even though it was flooded by about 15 feet of water, it met its flood design criteria and was back in full operation about 1:30 yesterday, when the flood waters receded sufficiently to restart.

We are a community that provided essentially of our waste water treatment and water facility needs without federal assistance, but that was back when the regulations were a bit easier to comply with.

We in Columbus face a very difficult problem with combined sewer overflows from about 3,000 acres of our old downtown area, where the sewers can be traced back to the early 1860s.

Well, I'm not here to talk to you specifically about Columbus, but about the Water Pollution Control Federation Research Foundation and how it can help communities like ours.

As Dr. Schwartz has indicated, we're here to ask you to help us get started with a much needed research effort in our industry.

I have experienced the congressional assistance to a similar organization in the drinking water industry. I served as a member of the American Waterworks Association's Research Foundation Advisory Council for the past nine years.

Due to significant initial assistance in your helping that organization get started, it is now an ongoing operation providing excellent applied research with essentially all funds coming from utility contributions.

In our water pollution control industry, we see state and Federal regulatory agencies continuing to implement more restrictive liquid and solid phase effluent and water quality standards.

Many of these new standards are new water quality parameters which were not foreseen when many of our facilities were built just a few years ago, and some are even still under construction.

In order to meet these standards, individual municipalities must invest whatever resources that it takes or face stiff penalties.

I'm not here to debate the regulatory atmosphere in the country, even though I might like to. I'm here to try to convey the dilemma that most waste water treatment facilities face today, whether they be public or private.

Using sludge disposal as an example, environmental regulations on sludge reuse and disposal are becoming more restrictive and therefore more expensive.

The volume of sludge being produced is growing, and the options for disposal are fewer. The debacle the nation watched last year when the city of Baltimore experienced their "Poo-Poo Choo-Choo" is typical of our sludge disposal problems.

Most of our short term answers to problems like sludge involve simply moving it around, such as depositing it in a landfill or possibly incineration.

The state of technology in current scientific knowledge tells us that we need better answers in many areas of waste water treatment.

Issues such as toxicity of effluents, water quality standards, combined sewer overflows, urban runoff, protection of wetlands, are among the issues for which we need better answers.

Our city being the first, along with Chicago, Atlanta, San Francisco, New York, Akron, Milwaukee, Salt Lake City, Seattle, Virginia Beach and others, are already supporting the WPCF Research Foundation, because no single municipality has the resources necessary to tackle the comprehensive research agenda necessary to find answers to critical environmental problems we face.

The WPCF Research Foundation offers municipalities an opportunity to pool our limited resources, providing an administrative mechanism ensuring that the common needs of the industry and the country are to be met and that the emphasis will be on practical, applied research.

A subscription based funding mechanism described by Dr. Schwartz will provide the WPCF Research Foundation with a long term, stable source of funds through which it will endeavor to assist municipalities in providing environmental stewardship.

However, my experience working with the American Waterworks Association Research Foundation tells me it will take two or three years before sufficient numbers of municipalities can be approached and approvals for funding secured from their governing bodies.

While many cities have and will step forward and support the foundation initially, others, like some of Dr. Schwartz' friends in Missouri, will want to be shown.

For this reason, it is critical that Congress act favorably upon the WPCF Research Foundation's request for a $2.5 million cooperative grant through EPA and that this subcommittee advance authority for the creation of a pilot program providing a match of research funds from the waste water industry in a ratio of one to one.

Thank you for this opportunity.

Mr. **Nowak**. Thank you very much.

Mr. Reinhardt, do you have any statement that you want to make at this time?

Mr. **Reinhardt**. No, I will not be adding to the testimony but will remain available to answer questions.

Mr. **Nowak**. Fine. Thank you very much.

We have, as you've heard before, total needs out there somewhere of $83 billion, and the dollars that are now in the system certainly are going to be totally inadequate.

Part of this hearing, and hopefully the new changes we'll make, will be to try to find a way to move both technology forward to reduce, I would hope, the $83 billion need through more efficient management and also, of course, to put some incentives into the law that would give us, as you've suggested in one of your first points, new revenue sources or mechanisms so that we can start to match those needs with dollars.

I think the request that you've made to me makes eminent sense in terms of trying to develop new technologies, because the old technologies are going to greatly exceed even that $83 billion if they were ever implemented.

It seems from the testimony that if the communities follow the letter of the existing law, you're going to find yourself in a straightjacket and start to expend many of these dollars without the cost efficiency that perhaps could be developed if you had the technical research base to leap from.

So I look at the evidence that you've presented, and I think it could be agreed upon by many of the other professional organizations out there that these touch everyone. Unless we can put together a package like this, for instance, if we only got more money, that is going to lead us faster to the goal. We can bring in some type of new technology and some flexibility as you mentioned in your second point and look at a better way to peer review perhaps before draft regs are made and bring into the whole system the states also who have a large part of this commitment to the funding mechanism and the loan funds.

We would hope that we can take some of your testimony and request the states for review to see if there's any type of partnership that we could move this forward a lot quicker.

I don't know the kind of response we'll get, but it certainly seems to me, both from the EPA and the states, a better overall program, especially when you look at providing new controls for CSOs and the other rural non-point, as well as the urban runoff question.

Where does that all fit into the total pollution load and what cost effectively could be and should be attacked first? I think those are questions that a good research base could start to provide, and then, of course, the technologies to answer and meet those needs could be implemented.

So we really appreciate your testimony. I look forward to getting together with you on some of the detail that you provided, and we'll keep you informed as to where we're going and the kind of responses that we'll receive from the States who have to join in.

In many instances, if we don't get those States on board, all of a sudden at the last minute, as we move the legislation through, you get every governor and every lieutenant governor and every state legislator writing about some point in the legislation so that they'll urge a vote against the whole legislation.

I think we're going to work very hard at trying to form that consensus this time, and if we can do it, I think it will make a great difference in the final product in what we can convince the states to do.

As Mr. Turner knows, private water companies have been somewhat successful, and we had recently some private water companies sold, taken out of the so-called private sector and sold to a municipality or joined with a larger system, but a purchase being made.

I'm just wondering if some privatization of these systems, especially in large growing communities, could not be put together, and I wondered if you had any thoughts on that, Dr. Whitman.

Mr. **Whitman**. Our observations are that there have been communities where privatization has worked. It's our understanding, at least it's my personal understanding, that there may be regulations and requirements under the law that, in some areas, make privatization difficult to implement.

To the degree that is true, then I think the law bears looking at inasmuch as in some areas privatization is an attractive alternative.

Mr. **Nowak**. Are there large numbers or are there any existing private water companies that are supplying to communities that are looking to expand?

Do you feel that there's a recognized opportunity out there that is not being pursued because of local regulations or any state or Federal?

Mr. **Whitman**. I'm not aware at this time as to the total interest that there may be. We at the federation have looked at the various funding alternatives, and we'll be happy to try to put together the information for you as to the interest and perhaps those communities that have started down the path toward privatization, so that perhaps we can give you the figures as to whether this is, in fact, something that may be growing and of widespread interest or perhaps still of limited interest. We'll be happy to get back to you with that.

Mr. **Nowak**. When a planned unit development is put together and a community does not extend its sewers to that planned unit development, in many instances a waste water treatment plant is built, and that's run by the "developer" or some subsidiary of the developer, I guess, until it's joined in in the future with a treatment plant.

Is that a fair statement? Do you see those growing in number as new communities come forward?

Mr. **Whitman**. I think that is a fair statement. It was our experience in Ohio that the waste water treatment plants that were run by private utilities that were in effect the developers were not always properly funded or properly operated, and in our own State government at the time, we were very interested, in fact, in having those plants be taken over by the municipalities or the local bodies of government.

Privatization is really a different element where we are talking about plants that may currently be municipal plants taken over by the private sector under contract and operated by the private sector with the funding provided by the user fees and the users of the system.

So in one sense we're talking about plants going from the private sector to the public and the other from the public sector to the private.

Mr. **Nowak**. Are there any private organizations now looking at investment into either existing water or sewer treatment plants throughout the country?

Mr. **Whitman**. It's my understanding, and Dr. Schwartz may be able to add to this, it's my understanding that several of the large engineering design firms and construction firms may have an interest in doing that and perhaps are actively pursuing that.

Mr. **Nowak**. Dr. Schwartz.

Mr. **Schwartz**. In addition, I would say some of the financial community has expressed interest in trying to develop new techniques for privatizing, investing private capital, in what had been public facilities.

I think we should also point out that there is a growing market for private operation of public systems, contract operations, perhaps a partial step to privatization, where the municipality retains ownership but contracts on a competitive basis for the operation.

I would say that's a steadily growing business in this country. It's also interesting to note perhaps, Mr. Chairman, that England has recently privatized their major water utilities, as you may be aware.

Mr. **Nowak**. I would be interested in having any other testimony you could provide on this matter and look forward to working with you.

[The material requested of Mr. Whitman and Mr. Schwartz follows:]

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April 10, 1990

The Honorable Henry J. Nowak
Chairman, Subcommittee on Water Resources
House Public Works and Transportation Committee
B370A Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Nowak:

In response to your request during the testimony of Dr. Ira Whitman at the March 22 reauthorization hearing on the Clean Water Act, the Water Pollution Control Federation (WPCF) is happy to provide the following information on privatization of wastewater treatment. This information was prepared by Lawrence Jaworski, a WPCF member who is a Vice President and Branch Manager for Metcalf and Eddy, a leading environmental engineering firm highly involved in privatization.

A. Level of national interest in privatization

National interest in privatization as a desirable alternative for the provision of public services, including water supply and wastewater management, continues to be strong and growing. The definition of privatization has broadened in recent years to encompass a number of options for private sector participation in system development and operation. While interest in the private ownership of wastewater treatment facilities has declined since enactment of the 1986 Tax Reform Act, there has been an increase in interest about other forms of privatization which enable the public sector to benefit from non-tax driven aspects, including:

1. Faster and lower construction cost
2. Construction cost and schedule guarantees
3. Long-term operating cost guarantees
4. Long-term operating performance guarantees (i.e., effluent quality and permit compliance)
5. Capital financing innovation

Full privatization is being pursued by the public sector for some specialized functions, such as sludge disposal.

By far, the greatest interest by local government in privatization is in the category of contracting services to the private sector that traditionally have been provided by the

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public sector. In a recent survey conducted by the accounting firm of Touche-Ross, over 55 percent of local governments indicated an interest in contracting services to the private sector in the next two years. Almost 40 percent of the surveyed communities indicated an interest in full privatization, i.e., ownership and operation of public sector facilities. Nearly 80 percent of the respondents indicated that privatization will be a primary tool to provide public sector services in the next decade.

While cost savings are the main reason for privatizing public services, many governments also privatize because of inadequate staff or facilities. It is estimated that respondents to the survey privatize over $1 billion worth of public sector services every year, and that this figure will rise to $3 billion per year over the next two years.

B. Profile of interested communities

Experience in the wastewater field has shown that the communities which implement privatization initiatives generally fall in the small to medium size range. Large metropolitan cities typically do not have the system construction needs faced by others since they were the original beneficiaries of federal funding (grant) programs. Large cities have experience in undertaking major capital programs and attendant operating needs, and have their own institutional "infrastructure" which enables them to undertake such programs. They also have experience in, and recognition by, the capital markets. The more entrenched nature of political interests in larger cities tends to work against privatization.

Small and medium-sized communities often have little experience with major capital programs, and lack in-house management and staff resources to undertake them. They have been low on state grant or loan priority lists, did not build needed facilities in the past, and now must undertake financing with little or no assistance. These communities frequently face growth pressures and need to add treatment capacity without burdening existing rate payers. They may lack knowledge of how to use the capital markets. However, the dynamic nature of these communities means fewer entrenched political interests which might oppose privatization.

Many communities lack interest in privatization because they are not confident that actual costs savings or other benefits may be realized from privatizing facilities or services. Other concerns include:

1. Loss of management control
2. Union or employee resistance
3. Lack of confidence that the private sector can effectively provide public services.

C. Barriers to privatization

Barriers to privatization exist at all levels of government. The first barrier is the reluctance of local governments to undertake capital projects in the absence of federal subsidies. This reluctance creates delays in the decision-making process. Less incentives also exist for private ownership due to the loss in 1986 of certain tax advantages, and restrictions on the private use of tax-exempt debt. Legislation, S. 700, has been introduced in the Senate to address this issue.

In many states, procurement laws do not allow for, or enable, the negotiated procurement of privatization services (particularly long-term services). Even where states do have enabling laws, the procurement process may be cumbersome and time-consuming.

At the federal level, the Office of Management and Budget's (OMB) A102 requirements to repatriate grant funds to the federal government in certain instances of the sale or granting of a "security interest" in a facility to a private party limit local flexibility. Also, EPA and OMB administrative procedures constrain the ability of communities to realize the full economic value of federally-funded projects by restricting the ability to "leverage" facilities through refinancing and other financing techniques. Finally, federal procedures constrain the use of revolving loan funds in support of privatization. For example, a community cannot readily use revolving loan funds to guarantee a municipality's privatization service payment obligations as a measure of the credit worthiness of a transaction, or to provide other subsidies to municipalities that undertake privatization initiatives. Legislation has been introduced in the Senate, S. 1514, which would address the last two issues.

I hope this information responds to your request. If you desire further information on privatization, you may wish to contact Mr. Jaworski at Metcalf & Eddy, 3901 National Drive, Suite 200, Burtonsville, Maryland 20866, phone (301) 622-6600. WPCF looks forward to working with you on water quality issues in the future.

Sincerely,

John A. Thorner
Director of Government Affairs
and General Counsel

Mr. **Nowak**. Let me now turn to Mr. Hancock from Missouri.

Mr. **Hancock**. Thank you, Mr. Chairman. I appreciate the testimony of this committee, and I also would like to welcome Mr. Schwartz one Missourian to another.

Mr. **Schwartz**. Even if we're not in the NCAA final 16.

Mr. **Hancock**. I was a little surprised when I heard your testimony, because you're requesting $2.5 million. I didn't know that we had talked about $2.5 million in Washington. I thought $2.5 billion was where we started.

Anyway, we are talking about what I think is a very modest approach to this, and I compliment you for your approach.

I do have a question, though, on the figure of $2.5 million and specifically the one on one. That's another area that is not approached here in the Congress too often.

It seems like most people that come up here want 100 percent funding plus. I am a little concerned, though, from the standpoint of the potential involvement of the EPA and the regulatory authorities in your research process if, in fact, you get a government grant to perform the process.

Sometimes, you know, by the time you get through you've spent $2 million to do the study before you even start, just as an observation.

Do you think that $2.5 million will be sufficient funds, when you recognize that you're going to have to be answering to who knows who?

Mr. **Schwartz**. Well, we've done some pro forma analysis, and we believe with the support of other parts of the industry that that would give us a fine start.

We're looking at a budget in the out years three to five years out at $10 million plus per year for the total research, and hopefully it would grow well beyond that.

In terms of EPA, we've talked with EPA at some length with the assistant administrators of water, R&D, and planning and gotten their verbal support.

We've proposed in our language that's attached a joint committee made up of WPCF Research Foundation council members and EPA that would review the recommendations made by the Research Foundation for specific research activities.

In the event that EPA took exception to some of those, the Foundation could fund them out of other sources or choose not to fund them, and we felt there had to be some approval process through EPA.

There's been a similar process, cooperative effort, with the AWWA when the Congress provided some funding several years ago, and I think it worked quite well.

Remember, too, that the WPCF by its nature is the technical people of the entire industry, and it includes as members the technical people out of EPA, state governments, and the like, and I think we work pretty well together.

I think they, too, believe there's a vast shortfall in technology research, and they want this to succeed, so I'd be very optimistic about working with them, but I'd be also happy to have additional funds.

Mr. HANCOCK. Well, there's never enough. Everybody wants to go to heaven, but nobody wants to pay for it. Are you familiar with how much money we're presently granting to universities for research in this area and, the various other research programs on the waste water problem?

Mr. SCHWARTZ. Most of that research, and it is substantial, is focused at regulatory issues rather than the development of technologies and new processes.

So it's focused at what's the cadmium transport in crops, what's the health effect of mercury vapors from incinerators as opposed to what are the technologies to remove those vapors or to remove the cadmium from the sludge.

That's where the shift in focus has come. It's driven by the regulatory agenda, and we've got virtually no funding, something on the order of $250,000 in the EPA budget, the way I read it today, for technology research in the water quality industry.

Mr. HANCOCK. One of the things that has been mentioned in the testimony is the sludge problem we have from a lot of these waste water treatment plants.

There happens to be one of those about four miles directly south of my house, and they've been having quite a problem with it.

They were selling it, and farmers were spreading on it their ground. Some of the neighbors don't like that too well. I understand that biotechnology is the area that we're getting involved in here on the disposal of sludge. Is that part of the work that you all are doing in the biotechnology area?

Mr. SCHWARTZ. By all means. Our people are heavily involved as an industry in looking at different types of biological treatment, composting and the like.

The EPA's proposed regulations on sludge address both land disposal and incineration, and sometimes one has to wonder, with the proposed regulations that you can't burn it, you can't put it on the land, and you can't barge it to sea, what you're supposed to do with it.

But what we need is better technologies for how to handle the sludge, how to treat it if we've got toxics in the sludge that prevent its use on the land, how do we remove those toxics either up stream in the sewer system or at the treatment plant, those kinds of studies and research needs to be done to let us address the problem better and make more efficient use.

There is a nutrient value to sludge, so we might as well look at the possibility of trying to recycle it on the land.

Mr. HANCOCK. Would this type of research have benefits in the removal of other waste forms other than we're talking about?

Primarily, we're talking about water treatment here on this committee, but would it have benefit, as you mentioned, for some of the technology use in landfills and that type of thing rather than just water treatment?

Mr. SCHWARTZ. Well, absolutely. I being a water and waste water individual would argue that most of the time environmental impacts reach people eventually by means of water, whether it's acid precipitation or it's landfill leachate that gets in the ground water, so many of the technologies we're going to be studying are not just for municipal waste water treatment plants, but it's the clean-up of contaminated landfill leachate, the clean-up of ground waters, the whole area of toxics is a vast subject are that we would proposed to be looking at.

Mr. HANCOCK. Thank you very much.

I don't have any further questions, Mr. Chairman.

Mr. NOWAK. Thank you.

Congressman Costello from Illinois.

Mr. COSTELLO. Thank you, Mr. Chairman.

Mr. Schwartz, I join my colleague from Missouri in welcoming you here today. Let me just say that while we are not from the same state, we are neighbors, and I have worked with your firm many times in the past.

I have several questions concerning your proposal, which I think is an ambitious proposal, it makes a lot of sense to me, and I agree with the chairman that we should explore the proposal in depth and to see if we can form partnerships with the various States who certainly have an interest in this problem.

I do have a couple of questions, and out of consideration for Congressman Bates who just stepped out, I know he is waiting to testify, I'll hold them down to a few.

Number one, as I understand it, one of the goals of your proposal would be to have the Research Foundation become self-sufficient within three years. Is that correct?

Mr. SCHWARTZ. Yes, sir.

Mr. COSTELLO. How would you intend to accomplish that?

Mr. SCHWARTZ. We already have a subscription program for municipalities, or utilities, as we refer to them. We have pledges or cash in hand that total something in excess of a half million dollars, I believe, and it may be attached to that testimony.

We have pledges and subscribers that now total $700,000, and that is an annual commitment from principally the utilities.

In addition, we have a subscription program just being started for the consultant members, and we'll have one started yet this spring for the manufacturers.

We then expect to go to similar programs into the discharging industry and to some other sources of funding.

Mr. COSTELLO. What kind of budget do you envision as necessary to accomplish the program?

Mr. SCHWARTZ. Everyone has their own, and my own opinion is that if we cannot achieve a sustained level of at least $5 million a year, we can't do the kind of research we want, and in reality I think we have to be $10 million and above to do the kind of research that will make a difference.

I'd like someday to dream that we could be like EPRI at $300 million a year, but that's in the distant future.

Mr. COSTELLO. Mr. Hancock asked you about the $2.5 million, if it will be sufficient, and in your opinion, obviously you would like to have more, but you think the $2.5 million will be enough to carry out the goals?

Mr. SCHWARTZ. It would be a terrific jump start for us. I think we can get the match very quickly if we had the Federal support.

I think it would encourage the communities to come in more quickly. What we're asking out of the communities, incidentally, is a fee right now of about two or three cents per person per year.

In fact, if there was a way to put a, I hate to use the word tax, put a fee on everyone in the country for a dime a person for their waste water, we could have an enormously effective research program.

Mr. **Costello**. Do you have communities in your own State that you have been talking to that will buy into this program?

Mr. **Schwartz**. I believe so. As you may be aware, in St. Louis they have some special problems with the district at the moment, but they've been supportive, not yet financially, but I believe we will have some good support out of the State of Missouri.

Mr. **Costello**. Are there similar proposals out there right now that we can expect to hear from other groups or organizations with a similar proposal?

Mr. **Schwartz**. Not that I'm aware of.

Mr. **Costello**. Very good. Thank you.

Mr. **Nowak**. Gentlemen, thank you very much. We will be pursuing some of the points that you have articulated in your testimony, and hopefully we'll be back to you in trying to develop some specific language, as well as talking with others about the suggestion you've made.

I think that it would be a good broad approach to many of the problems that individuals are coping with out there and are trying to cope with, and we'll be looking forward for any other input you would like to give to us.

We're going to keep this record open as we go through the next month or two, so we will have the opportunity for any additional matter, and then perhaps we'll be in touch with you as we get some reflected analysis hopefully from some of the other players in this area.

Mr. **Whitman**. Thank you very much, Mr. Chairman.

Mr. **Nowak**. Thank you very much for your attendance.

[Mr. Whitman's prepared statement appears on page 579.]

[Mr. Schwartz' prepared statement appears on page 537.]

Mr. **Nowak**. Our next witness will be Congressman Jim Bates from California, who patiently waited throughout the morning for his testimony, and we appreciate his patience.

Congressman, any statement you have we'll accept in the record, and you may proceed as you desire.

TESTIMONY OF HON. JIM BATES, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. **Bates**. Thank you very much, Mr. Chairman.

I had a couple of additional letters with my statement that I was hoping could be entered in the record.

Mr. **Nowak**. Without objection, so ordered.

Mr. **Bates**. Basically, San Diego, of course, is required under the Federal Water Pollution Control Act to treat its sewage at a secondary level and has reached a consent agreement with the EPA and I think was the last large major metropolitan area to do so.

The project that's on line now is a $2.8 billion project, and because the city was not wise enough to seek the grant program while it was available, I think the majority of the costs will be borne by the water rate payers, in effect the citizens of the San Diego region.

If that is absolutely necessary, then that's what has to happen, but there has been an issue raised that I think needs review or needs some discussion, and that is with respect to the state-of-the-art technology with respect to secondary treatment.

As we're all aware, the Federal Clean Water Act was enacted in 1972, and this is 1990, and a great deal of changes have occurred.

I was particularly impressed by a letter that I received yesterday from Scripps Institution of Oceanography from one of the Associate Research Marine Biologists.

I think that this describes the thrust of what I would like looked at, and I know the National Research Council is doing this study.

The problem with the study, of course, is that it may come after the city, because they're on a fairly tight time frame, it may come too late to incorporate the results of the study into appropriate technology for the treatment.

But perhaps not, and perhaps there's a way that the act could be modified to give some kind of flexibility there. The letter goes on to state the basic issue in the Clean Water Act is based on specific technology, secondary treatment, which is outmoded and inordinately expensive in terms of the often marginal benefit to the marine environment.

Furthermore, the law mandating secondary treatment does not consider the impacts to land and air quality which secondary treatment will cause.

Any rational environmental protection scheme should balance positive impacts in one medium with negative effects elsewhere, especially when the negatively impacted areas are where people live.

With demographers predicting increasing population in the coastal areas of the country, San Diego is one of the fastest growing, critical evaluation of waste management practices are crucial.

New technologies for sewage treatment which can achieve comparable or better results than secondary at a fraction of the cost have been developed since the Clean Water Act was passed in 1972.

Advanced primary treatment which uses polymers and ferric chloride to electrochemically precipitate out suspended solids and absorb pathogens and toxins is a prime example.

I won't go on, I'm not sure I can say all of these words correctly, but I think I make the point that the technology and the use of a deep ocean outfall could be looked at as a means of dealing with this problem and perhaps reducing the high cost.

This plan that San Diego has developed does have a 50 percent water reclamation, so there will be, I think, some additional benefits, and that also accounts for some of the high costs.

I am very concerned about this and hope that there is a way that we can take a look at this and preserve the options, and I know there is the risk of being on the down side with the environmentalists, and I do have 100 percent voting record with the League of Conservation voters, so only armed with that record do I feel brave enough to come forward and raise this issue of what some might say are weakening the standards or opening Pandora's Box.

But I appreciate the chance to come forward today and to present this testimony for the record.

Mr. **Nowak**. Thank you very much for this additional research, and certainly the committee has recognized the member's interest in this area before and his commitment to not only getting the environment cleaned up, but doing it in the most cost effective manner that can be pursued.

The panel before your presentation talked about the amount of research base that should be expanded and the development of new technologies to start to reduce and find the most cost effective method to achieve our goals that we're looking at, and certainly it really corresponds to what you have been advocating for over a year now to the committee.

Our involvement to look at the National Academy of Science study is really a small portion of what they've been advocating today in much broader areas of research.

Your particular San Diego problem is one that we will be following with great interest, because I think if applied technology can be found and if the Academy of Science moves forward, you should certainly have the option of using that new technology to not only reduce costs but improve the environmental output of your waste water treatment total facility.

So we will be looking forward to working with you, and certainly as soon as we can see it demonstrated that there are new and different technologies coming out of the Academy of Science study or any future studies as the whole program moves along, that option certainly should be there to implement at more cost effective dollars.

I appreciate not only your concern for the taxpayer, but for the protection of the environment, which I know is your paramount interest in this whole matter.

Let me turn to Mr. Lightfoot from Iowa.

Mr. **Lightfoot**. Thank you, Mr. Chairman.

Thank you, Mr. Bates. More a point of personal curiosity than anything, isn't San Diego using some of the effluent, to go back as a conservation plan, using that to water golf courses and that type of thing? Isn't your committee the one that's doing that?

Mr. **Bates**. There are a number of projects of relatively small scale, the Santee Lake project that's been existence for a long, long time but is not a big project, but it is an effective one of water reclamation, and the water is drinkable.

Another project is the Hyacince, in Mission Valley, which is a successful project but, again, on a relatively small scale, but there are plenty of golf courses and plenty of need for that water, and that will be part of the water reclamation plan that is a part of the city of San Diego's proposal.

But even so, I think the bottom line is that if the state-of-the-art or the appropriate technology can meet the performance standards or better, if that option is in the legislation so that when it becomes available we don't have to come back and amend the law and amend the engineering plans that are being put together, if they could incorporate the flexibility and hold that off at the longest possible point, I think that's really what we're seeking, and I just don't know how viable that is given the bad situation San Diego now finds itself in.

I think the argument that EPA would make is that they have got everyone else to agree, and they're going to pay the cost, and they've signed consent decrees or developed their earlier plans and are implementing them, so why should San Diego be an exception.

I think that's a good argument, except there are the two possible exceptions, which might be the deep ocean outfall that not every city has and if that does not degrade the environment, then that should be considered; the second point is that if there is appropriate technology that comes on line, then everyone and all users should be able to go to that technology.

Mr. **Lightfoot**. Your source of water is, what, basically runoff from snow melt and so on?

Mr. **Bates**. Well, San Diego is a semi-arid desert. Most of it's imported. We get some from the Hoover Dam and then some from north, so it's a combination, the Colorado River as well as the American River and the Delta there.

It's quite controversial in California, water rights and water plans and water subsidies, but we have to import most of our water.

Mr. **Lightfoot**. The reclamation could play, in the future with correct R&D and so on, a major role in alleviating some of your problems.

Mr. **Bates**. The big problem with water reclamation has been that it's not cost effective, and part of that is because we subsidize our other water.

The power that pumps the Hoover Dam water into San Diego County only costs seven-tenths of a cent per kilowatt, and I don't know what you're paying for your energy, but most people are up around 10 or 12 cents.

So with that tremendous subsidy, it's not cost effective at this point. But at some point, that will all change.

Mr. **Lightfoot**. I think my pump at home is running about 12 or 14 cents a kilowatt to get it out of the ground. My best reclamation project is to teach the kids they can wear their jeans more than once without washing them, but you know how that goes. Thank you, Jim.

Mr. **Nowak**. Thank you very much.

Mr. Packard from California.

Mr. **Packard**. I want to welcome my colleague from San Diego County. We represent almost coterminous districts, and I appreciate him being here to testify.

Let me just ask you a question, Jim. How long has the city of San Diego been working on a waiver of secondary treatment, and where does it stand now?

Mr. **Bates**. Well, I think the application for the waiver first started about 13 or more years ago and was pursued and then was withdrawn by the Mayor of the City of San Diego.

Mayor O'Connor withdrew the waiver, and I think that was a mistake, and most cities, as I'm sure you're aware, pursued both the grant application as well as the waiver, and if the waiver didn't come through, at least they were getting partial funding on the federal program.

I think it was a mistake that the city withdrew the application for the waiver, and part of the problem is not only not meeting the federal clean water standards, but also the State standards.

Mr. **Packard**. It was likely perceived, and I suspect rightfully so, that after 13 years of negotiating and working and pursuing a waiver with the EPA that the city came to the conclusion, especially when they were under a cease and desist order, they came to the conclusion that they better move ahead and not simply delay longer the decision to go to secondary treatment.

At the present time now, they've negotiated an agreement with the EPA. Is that correct?

Mr. **Bates**. Right. They have a consent degree that under court order——

Mr. **Packard**. They have negotiated an agreement that meets with the approval of both the city and the EPA, and I believe if I am not mistaken they have either signed that agreement or are about to sign it. Is that correct?

Mr. **Bates**. That's right. I think that they were compelled to reach agreement, and I think there is some duress there, and I think there was some threat of significant fines, and I think they had no choice, and I think they did the right thing in reaching agreement.

The only reason I'm here, and I'm pleased to see a friendly face from San Diego who is so familiar with this, is to simply make the plea that if there can be some flexibility in the Act that allows for state-of-the-art technology, that if advances become available and can be shown to meet the high standards of the Clean Water Act, not to lower those standards but simply allow for more flexibility in achieving them, that that be considered.

Mr. **Packard**. If, in fact, that were possible, I would not disagree at all with my colleague from San Diego, but I think the perception is and the general agreement is that the waiver is now not attainable, not available, and after so long of a period, it's not an option.

I would hate to see this committee or the Congress send a message back that would create a desire on the part of the city to further delay making moves and efforts to raise the money and to do the plans for secondary treatment.

That's my major concern at this point is that one of the flaws of the history of the situation, in my judgment, is that it's gone so long in making a determination that now they're caught in a serious bind because the cost of the project has gone up seriously over the 13 years.

Had the decision been made earlier to have gone to secondary, I think that we would have been able to have worked out financing mechanisms at the federal level plus the city would have been able to plan for it.

Overall, they would have moved forward and made progress, whereas now if we send a signal back that simply says to the city, well, there's still hope out there for a waiver of secondary treatment, and thus a further delay or a further complication of the agreements that have now been signed, I think would be a mistake to send that message, and that's the concern I have.

If, in fact, cities like San Diego could get a waiver that are now dumping on the ocean outfall, then I would be perfectly willing to join and say let's look at that whole question of ocean outfall versus the environmental problems that it creates versus the cost versus non-ocean outfall disposal and requests for waivers.

But I'm not anxious to see us send a message back to the city that there's still hope that they don't need to honor the agreement.

Mr. **Bates**. Well, in response, I would agree with you. We do not want to send that signal, and hopefully that's not the signal that I'm sending here to the Chairman and to the subcommittee.

I think there are two issues. With the ocean outfall, you might be looking at a waiver, but the other point where secondary treatment is mandated, all I'm saying is you should have the flexibility to achieve the same water quality standards of secondary treatment without being mandated to that treatment, that you can use other appropriate technology.

That really, I think, is a different question than the waiver, so I don't think it's a question of asking for the waiver.

I think we're beyond that. The agreement is in place and has to be complied with. I'm simply saying that as other more appropriate technologies are developed, they should also be allowed to be considered and be used, particularly if they're more cost effective.

Mr. **Packard**. Mr. Chairman, I have no further questions.

Mr. **Nowak**. Thank you very much, Congressman. We will be back to you as we receive any further information, especially from the study results.

Mr. **Bates**. Could I just have one point of clarification, Mr. Chairman? Was it the intent of the Chair that I was seeking a waiver for the city?

I thought that I was not. I did not want to send that signal, and if that was the understanding, that was not my intent.

Mr. **Nowak**. No, that was not the understanding of the Chair. We were discussing the other aspects.

Mr. **Bates**. Okay, thank you.

Mr. **Nowak**. Thank you.

[Mr. Bates' prepared statement appears on page 436.]

Mr. **Nowak**. We have a vote on the House floor, so unfortunately we'll have to take a few minutes to vote, and then we will come right back and follow the rest of the testimony as our other witnesses all have commitments this afternoon, and we will try to get through by our 1:00 appointed time for the next series on the Onondaga Lake witnesses. Thank you.

[Recess.]

Mr. **Nowak**. The subcommittee will come to order, and we'll move into our next segment with Mr. Ron Pacella, who is the president-elect of the National Utility Contractors, and he will be accompanied by Brian Connor, who is their Director of Government Relations.

Gentlemen, welcome before the committee. As with the other witnesses, your total statement will be incorporated in the record, and you may proceed as you desire.

TESTIMONY OF RON PACELLA, PRESIDENT-ELECT, NATIONAL UTILITY CONTRACTORS ASSOCIATION, ACCOMPANIED BY BRIAN CONNOR, DIRECTOR OF GOVERNMENT RELATIONS

Mr. PACELLA. Mr. Chairman, it is my pleasure to represent NUCA before the Subcommittee on Water Resources during hearings on the Federal Water Pollution Control Act.

Water and sewer funding is a top NUCA priority. Our organization believes that funding for waste water treatment programs should be funded at the levels authorized by the act.

Second, current laws should be amended to delete the requirement that municipalities must repay prior EPA grants before entering privatization construction projects.

Our association has established a top level working group to examine the future of water and sewer funding in light of the possible phase-out of EPA's waste water treatment program under the Act. Let me take this opportunity to share our preliminary thinking.

Congress may need to reopen the Federal Water Pollution Control Act, primarily due to the federal funding shortfalls. A question needing further examination is federal mandates for water treatment categories which are not eligible for SRF funds. However, a renewed Federal grant program for these categories could endanger the future of SRFs. NUCA and our National network of affiliated chapters were able to convince many State Legislators and Governors to establish SRFs because the existing construction grants program is set to expire on September 30, 1990.

In other words, a use it or lose it proposition was the driving force in those legislative campaigns. Our main concern is that Congress should be careful of undermining state programs.

The states have demonstrated a good faith effort. As with any new program, the initial results have been mixed. A second worthwhile issue is the implementation of a national infrastructure act with a dedicated source of federal funding.

The Public Works Committee has held extensive hearings on various legislative proposals in the past. Although the main obstacle to these initiatives is the funding source, some members of Congress have suggested a gasoline tax increase to support an infrastructure program which should include sewer and water construction.

Finally, a long range alternative is the establishment of a water and sewer trust fund. A report by the National Council on Public Works improvements recommends financing of a large share of the cost of public works by those who benefit from the services.

A dedicated source of funding could involve a federal surcharge on the sale of water and sewer materials, water use and or consumption, per capita consumption, a combination of the above, or other appropriate measures.

Such a trust fund should be off budget so that unspent balances are not used to disguise or involuntarily underwrite the federal deficit.

The subcommittee may wish to examine these alternatives in further detail by requesting a formal study by the appropriate legislative agency.

Thank you for the opportunity to present our association's views.

Mr. **Nowak**. Thank you very much, Mr. Pacella.

Mr. Connor, would you have anything further that you'd like to add to the testimony at this time?

Mr. **Connor**. No, Mr. Chairman. It's always a pleasure to be back here among my colleagues on the Public Works staff and the members on this committee.

I've never been on this side of the witness table, and I'm really honored to have my own tent card with my name on it and to be back here with you.

Mr. **Nowak**. Well, welcome back. I know of your good work on the committee, and we certainly look forward to working with you in your new position and observing the kind of work that NUCA has performed in carrying out their portion of achieving our goals of clean water.

It's recognized, I think, very broadly their participation not only in the actual work, but your other suggestions as we look at the possibility of a water sewer trust fund and look at obtaining hopefully a consensus from the States as to how we can move this program forward in the least costly way and make it as effective as we can.

Your testimony that you submitted would be, I think, a great help, and we may be calling on you to move with us as we try to get a broader information base out there, especially to the local officials and to the State DECs, who, as you know, play a large role in not only determining priorities but looking at alternatives.

The new technologies that may be coming into existence may be of some help in performing through the whole process a program that works and one that can keep up with the demands that are out there.

We certainly appreciate your concern and your involvement in helping us achieve these goals.

Let me turn to Arlan Stangeland, who is back from the Committee on Agriculture.

Mr. **Stangeland**. And a number of other places as well. Thank you, Mr. Chairman.

I really have no questions, just to say welcome and thank you for your input. I want you to know that we feel you are a very valued resource as we struggle with the problems of clean water and some of the other programs we work with here.

I'm pleased to note that you recognize and thank those who supported the protection of the funding for water and waste water, the Farmers Home programs, and I would hope that that message would get out among the rural areas, because I'm sure for some of us that vote can be misconstrued as talking out of two sides of our mouth when we talk about rural economic development on one hand, and on the other hand talk about a denial of allowing full access to certain funds.

So for this member who preaches rural development, your Farmers Home initiative makes sense. But I also recognize, and I think I explained to a number of my colleagues prior to that vote, that we are finding less and less resources to address the problems of water, and the ones who have been left out in the past are the rural areas, the small communities. We dare not harm or endanger them further by taking away a source of funding to solve both drinking water and waste water.

I appreciate the fact that you've recognized that in your testimony.

Mr. CONNOR. It was a tough vote and a close vote, Congressman, and we certainly appreciate your support.

Mr. STANGELAND. I don't have confirmation of what the solution is, but I'm told that there has been a solution arrived at between the two major participants in that debate, and I'm hopeful that that determination they've come to makes sure that it does protect the resources for water needs.

We look forward to working with you as we wind our way through this process, and we look forward to your valued input. Thank you.

Mr. NOWAK. Thank you again for your appearance, and we'll be back to you with perhaps further written questions.

Mr. PACELLA. Thank you very much.

Mr. CONNOR. Thank you, Mr. Chairman.

[Mr. Pacella's prepared statement appears on page 517.]

Mr. NOWAK. Now I'd like to bring before the committee Sherri Zedd, who is Vice President of Congressional Relations, American Wood Preservers Institute, accompanied by Victor Lindenheim, the Vice President of Regulatory Affairs.

TESTIMONY OF SHERRI ZEDD, VICE PRESIDENT, CONGRESSIONAL RELATIONS, AMERICAN WOOD PRESERVERS INSTITUTE, ACCOMPANIED BY VICTOR LINDENHEIM, VICE PRESIDENT FOR REGULATORY AFFAIRS

Ms. ZEDD. Mr. Chairman and members of the committee, thank you for allowing me to testify today. I am Sherri Zedd, Vice President of the American Wood Preservers Institute.

With me today is Victor Lindenheim, Vice President for Regulatory Affairs. Our members include the producers of treated wood products, including railroad ties, utility poles, marine and foundation piling, decking and fences, as well as the manufacturers of EPA-registered wood preserving pesticides.

I will summarize and respectfully request that the entire statement be entered into the record.

Mr. NOWAK. Without objection, so ordered.

Ms. ZEDD. Thank you. On December 30, 1988, EPA's Office of Solid Waste issued a proposed regulation which would have a devastating impact on the wood preserving industry.

Compliance costs would eliminate many companies, increase consumer costs, and provide no additional environmental benefit when compared with alternative methods to regulate the industry.

EPA's proposal addresses how the industry handles all wastes and residuals from its processes utilizing only one statute, RCRA.

Our industry has not fought the idea of regulation, rather we have been advocating a multi-statute alternative formally submitted to EPA in 1987 which would integrate provisions of various statutes, RCRA, the Clean Water Act, CERCLA, and FIFRA, which currently govern various portions of our facilities.

This approach would be as protective of human health and the environment as a RCRA-only regulatory method. One of the most important provisions of the multi-statute approach is the industry's recommendation that process water discharges continue to be regulated under the Clean Water Act with specific, best available technology, economically achievable standards established for handling process waters.

We also believe that review of effluent guidelines for discharge of wood preserving process waste waters should be given a high priority from EPA.

However, recent EPA actions have caused concern in our industry. On January 2, 1990, the agency announced its two-year plans for reviewing and revising existing effluent guidelines as requested by section 304(m) of the Clean Water Act amendments.

Timber products processing, including wood preserving, was not among the 15 priority industries scheduled for review and action, even though we had been requesting such a review since 1987.

We view this omission as a failure to follow Congress' mandate for a multi-statute regulatory approach and believe that the agency may be missing an opportunity for pollution prevention and cross media pollution, which is a criterion of the effluent guideline announcement.

Industry concurs with EPA that regulation of our waste waters is necessary. However, we believe that EPA's major concerns can and should be addressed under the authority of the Clean Water Act, not RCRA.

We view EPA as using RCRA authority to provide a new enforcement tool for clean-ups of some past operations that represent a small portion of the industry.

Industry contends that regulation of these waste waters under RCRA will not provide any significant additional human health and environmental protection benefits.

We also believe that the Office of Solid Waste proposal may be based on operations that no longer exist at wood preserving sites, such as surface impoundments and spray fields, operations which were recommended by the EPA in the mid-1970s to meet this goal of zero discharge of the Clean Water Act.

The wood preserving industry is concerned that if waste water is listed as a hazardous waste, currently accepted and technically sound management methods, including pre-treatment and discharges to municipal sewage plants, will no longer be available due to the stigma of the hazardous waste listings.

Further, does it make sense to regulate this material in the same manner as highly concentrated sludges that are more appropriate for possible RCRA controls?

Effluent guidelines and pre-treatment standards can be very effective in regulating discharges of water borne toxics contained in process waste waters and are reflective of congressional intent expressed in section 304(m) of the Clean Water Act.

In summary, I am concerned about the potential impact of a regulatory approach that relies exclusively on RCRA and does not give full and proper consideration to Clean Water Act authorities.

The Clean Water Act provides greater flexibility for regulation of waste water, while at the same time achieving the same protection of human health and the environment.

I hope this viewpoint will be given consideration by the committee and EPA. Mr. Chairman, this concludes AWPI's prepared testimony. I will be happy to respond to any questions.

Mr. Nowak. Thank you very much. Your multi-statute approach is one, I believe, that is followed in other areas. Are you familiar with other areas that have taken on that approach?

Mr. Lindenheim. Yes, Mr. Chairman. Specifically in RCRA, there's section 1006(b) that calls for integration of statutes, and it cites a number of statutes the regulators are requested to look at when considering regulation of residuals and wastes, including the Clean Water Act.

Mr. Nowak. Let me turn to Arlan Stangeland.

Mr. Stangeland. I have no questions. I think your request makes eminently good sense, and certainly we will try to follow up on it the best we can, because I think you're kind of in a Catch 22 almost, and that ought to be corrected and it should be correctable. We appreciate your testimony.

Ms. Zedd. Thank you.

Mr. Lindenheim. Thank you.

Mr. Nowak. Just one further question. The flexibility that you're looking at, is there a substantial difference that you feel could be applied if you went to the multi-statute approach?

Mr. Lindenheim. The biggest contrast between RCRA and the Clean Water Act comes into play when you're looking at a material such as waste water.

Under RCRA, if a material is listed as hazardous waste, that is, for example, wood preserving waste waters, that material, treated to whatever level you can get it to, if it were treated to drinking water standards, that material would still be derived from a hazardous waste and be considered a hazardous waste under the regulations of RCRA.

Mr. Nowak. All right. Fine. Thank you for your testimony, and if we have further questions, we'll certainly bring this to the attention of EPA and see what we can resolve.

Ms. Zedd. Thank you.

Mr. Lindenheim. Thank you.

[Ms. Zedd's prepared statement appears on page 597.]

Mr. Nowak. Our last witness in this morning's session will be Susan Murcott, who is a graduate student at the Massachusetts Institute of Technology.

TESTIMONY OF SUSAN MURCOTT, GRADUATE STUDENT, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Ms. Murcott. My name is Susan Murcott, and I am a Research Assistant at MIT, working under Professor Donald Harleman, Board Professor of Engineering.

I am one of a team of people developing new chemical waste water treatment technologies for publicly owned treatment facilities.

My testimony today on the need for statutory support for new and innovative waste water treatment technologies represents the views of Professor Harleman, who is unable to be present, myself, and other members of the MIT team.

This testimony makes three key points. One, it details how the Clean Water Act has frozen technological integration at the 1972 level, with the result that U.S. industry is competitively disadvantaged; two, it describes chemical treatment, the most promising new waste water treatment technology on the horizon; and three, it makes recommendations for recognizing chemical treatment technology in the new Clean Water Act.

Why has innovation been frozen at the 1972 level? One of the successes of the 1972 Federal Water Pollution Control Act has been that it not only mandated but also provided substantial grants to construct secondary treatment facilities.

Secondary treatment is defined in the Secondary Treatment Information Regulation, as you know, as 85 percent removal of two constituents, total suspended solids and BOD, biochemical oxygen demand.

By the late 1980s, most inland municipalities had achieved secondary levels of waste water treatment. The situation in coastal areas, however, was different.

Recognizing that coastal areas are nixed by tidal currents and are readily reaerated by virtue of their large surface areas, section 301(h) of the 1977 Clean Water Act allowed coastal municipalities to propose alternatives to secondary treatment appropriate to the different conditions of marine ecosystems.

Over 200 coastal municipalities applied for 301(h) waivers. Most proposed primary treatment plus an extended ocean outfall.

In denying the vast-majority of these applicants, the Environmental Protection Agency was able to cite the benefits of secondary treatment, especially in terms of suspended solids and toxics removals.

The major municipal treatment districts in the Los Angeles and San Diego area began about 1985 to improve their treatment efficiencies by use of chemical and polymer additives in their primary treatment plants.

These changes were designed to meet the effluent and water quality standards of the California Ocean Plan. This state water quality act recognized that the high level of BOD removal of 85 percent required by EPA's secondary treatment mandate was unnecessary for effluents discharged offshore.

Instead, the California Ocean Plan specified that dissolved oxygen depletion be no more than 10 percent below its natural ocean level.

Because of concern with heavy metals and other toxics that absorb onto particulates, the California Ocean Plan requires 75 percent removal of total suspended solids, only slightly less than the 85 percent removal required in the secondary treatment information regulation.

This form of treatment is termed advanced primary. Based on five or more years of extensive ocean monitoring, a number of scientists at Scripps Institute of Oceanography, one of whom we heard cited this morning, have testified to the effectiveness of advanced primary treatment and the California Ocean Plan in protecting California's ocean ecology.

These communities are now under EPA orders to spend billions of dollars to go to full secondary treatment. Because the 301(h) waivers, which were based on the conventional primary treatment alternative have been denied, there is now no administrative process to consider the new chemical treatment alternative.

Therefore, the promising innovative technologies developed in California have been undermined. Today, with 99 percent of the 301(h) waivers in the Continental United States, not including Maine, now denied, the Clean Water Act has achieved regulatory uniformity, but at the expense of its best efforts at innovation.

The unforeseen effect of the Clean Water Act is that it has frozen waste water treatment technology at the 1972 level. It has held the United States back from developing new waste water treatment technologies.

It has put us at a competitive disadvantage in terms of overseas competitors. Right now, Norway and Sweden have taken the lead in cutting edge technologies in the field of waste water treatment, improving upon the chemical processes that were pioneered in San Diego, Los Angeles, and Orange County.

These Scandinavian countries are selling their treatment technologies in Spain, Portugal and in the Soviet Union. Our response must be that the new Clean Water Act actively encourage the development and application of chemical treatment and other innovative technologies.

Before I go further, let me describe chemical treatment. Our present sequence of waste water treatment stages came about for historical reasons.

At the turn of the century, primary treatment was developed to remove the worst impurities by gravitational settling.

In the 1930s, primary treatment proved inadequate to break down organic material, so another stage, biological secondary treatment, was added.

In the 1970s and 1980s, as high nutrient loadings of phosphorous and nitrogen were recognized as the major cause of algal blooms and oxygen depletion, tertiary treatment was prescribed.

What is chemical treatment and how does it fit into these stages? Chemical treatment enhances treatment efficiency by adding agents designed to cause coagulation and flocculation of organic compounds and particles.

The larger particles formed by this process are readily removed in settling tanks. Chemical treatment, using large quantities of alum or lime, has been an alternative to biological treatment for more than 30 years.

However, these chemical processes generated considerably more sludge than biological treatment. In addition, the sludge presented difficult processing and disposal problems.

It was not until the mid-1980s that the use of ferric chloride and anionic polymers reduced the concentration of additives to about 10 percent of that used previously.

The break-through in chemical treatment technology came after the 301(h) waivers had been filed. Chemical additives have always been an essential component of tertiary treatment technology, especially in the removal of phosphorous, a key element in controlling eutrophication.

Since the mid-1980s, chemical treatment techniques have been refined to the point where we can now use these processes in the primary phase alone and yet achieve secondary and tertiary results.

Today, chemical treatment, especially at the level developed in Scandinavia, based upon the pioneering work done by the cities out on the West Coast, supplants the need to build and operate costly secondary and/or tertiary treatment facilities.

These ideas are not merely theoretical; they have been proven in full scale plant operations in five West Coast facilities, in Ontario, Canada, and in over 100 facilities in Norway and Sweden, all of which have been in operation for the past three to five years.

About two-thirds of the ferric chloride, most of the phosphorous, and all of the biodegradable polymers wind up in the sludge.

The high phosphorous content in the process sludge makes that sludge potentially attractive as a soil conditioner. The remaining one-third of the ferric chloride remains in the effluent where it is at such low concentrations that it causes no harmful effects in marine environments.

I understand that you received this table, and the next part of my testimony refers to this table.

The water quality affects. Suspended solids. Chemical treatment achieves levels of suspended solids removal equivalent to or better than biological treatment.

You can see in the chart, it's 94 percent removal of total suspended solids, as opposed to 85 percent with biological methods.

Under BOD, biochemical oxygen demand, chemical treatment is capable of removing 50 to 85 percent of BOD. The secondary treatment BOD standard of 85 percent is appropriate for fresh water systems but has not been shown to be necessary for municipalities which discharge into the marine environment.

Nutrients. The two nutrients of concern are phosphorous and nitrogen. Chemical treatment achieves 95 percent phosphorous removal compared to 30 percent phosphorous removal in biological secondary treatment.

In Scandinavia, these high levels of phosphorous removal are considered to be essential in controlling algal blooms and consequent oxygen depletion problems.

For discharge into marine environments, they have found that the high levels of phosphorous removed reduce or eliminate the need for the more difficult and costly removal of nitrogen.

Toxics. Chemical treatment achieves the same level of toxics as biological secondary treatment.

Cost implications. As you know, the Federal Municipal Waste Treatment Construction Grants Program will terminate in 1991, and unless reinstated will mean no federal grants for construction of new waste water treatment facilities.

Costs estimated at $10 billion needed for coastal secondary treatment plants still to be built will be passed on to citizens in the form of huge water and sewer rate hikes.

Chemical treatment is the solution to the cost problem. Chemical treatment can be carried out in primary treatment plants.

It entails, therefore, no new capital costs to build or fund secondary or tertiary facilities. The operation costs of implementing chemical treatment in a primary treatment plant would be about the same as the operation costs for a secondary treatment plant.

For example, in my sewage district of 200,000 people in Salem, Massachusetts, we are currently under court order to site and build a secondary treatment facility that is estimated to cost $200 million in capital costs and $1 million per year in operating costs.

But chemical treatment in our district, which we are currently testing, will cost only $1 million per year, simply the operations costs, no new capital costs, so the equivalent costs of the operating costs of a secondary treatment facility.

Similarly, the Massachusetts Water Resources Authority is now in the design stage for a new primary and secondary treatment plant to clean up Boston Harbor.

The secondary plant will involve a capital cost of $2 billion and operations costs of $10 million per year. Chemical treatment for Boston Harbor would cost only $10 million per year in operations costs, no new capital costs.

Chemical treatment allows immediate implementation. The 301(h) waiver process was abused when some coastal municipalities used it to delay building secondary treatment.

Today, siting design and construction of coastal secondary treatment facilities is still as much as 10 years out with the concomitant delay in cleaning up our coastal waters.

Again, chemical treatment is the answer because it can be implemented immediately in primary treatment plants.

Recommendations for the new Clean Water Act. We need mechanisms within the new Clean Water Act for Congress and the EPA to encourage rather than discourage promising new technologies which show advantages over biological secondary treatment.

Because chemical treatment has not until recently been able to meet one of EPA's water quality criteria, that of 85 percent BOD removal, government officials have discouraged initiatives to conduct research or to invest in this process.

The following are recommendations for the new Clean Water Act. One, legitimize chemical treatment methods, where biological treatment is cited in the Clean Water Act and related EPA regulations change the rewording to chemical and biological:

Two, reword section 301(k) which allows variances for innovative technologies to promote full scale tests of promising new chemical technologies at selected publicly owned treatment facilities.

Finally, section 304(d), and I need to correct that, there's a typo error, it's (d), not (b), section 304(d) recognizes several alternative technologies such as trickling filters and waste stabilization ponds as equivalent to secondary treatment. Include chemical treatment on that list of equivalent to secondary treatment technologies.

In closing, I would like to say that a National Academy committee has recently been constituted to evaluate the scientific, technological and economic bases for waste water management in coastal areas.

Professor Donald Harleman is on that committee, and I will work closely with him in that study. It is our hope that the Water Resources Subcommittee will keep in close touch with the National

Research Council Committee in order that the collective wisdom and expertise of both committees can be brought to bear on the new Clean Water Act.

Funding for this National Research Committee has been provided by the EPA, the city of San Diego, the National Science Foundation, and also the Boston Society of Civil Engineers. Thank you.

Mr. NOWAK. Thank you very much for your testimony. Several questions you raise, of course, are of a very broad nature when you look at the allegations that government officials have discouraged incentives to conduct research or to invest in this process.

Have you had substantial contact with EPA on the technical side of these questions?

Ms. MURCOTT. I'm going over to EPA this afternoon, in fact. I'm meeting with Brian Moss. It was he, I believe, who was responsible for mandating that the South Essex sewage district, which is in Salem, Massachusetts, which is my sewage district, do chemical testing.

So MIT has been working side by side with Delta Chemicals and the South Essex sewage district to do chemical testing. My understanding of that, and this is new coming from EPA, is that they see it as a mitigation measure, that rather than fining the South Essex district for not being in compliance with full secondary treatment, they are having them do chemical testing to improve their effluent in this interim period before going to biological secondary treatment.

Where MIT is happy is it gives us the opportunity, it's the first experiment on the East Coast of chemical treatment, to show that this method can work.

We're just north of Boston Harbor, and if we can make it work in Salem Harbor, we hope to be able to show that it can be made to work in Boston Harbor.

Mr. NOWAK. All right. We'll have other questions as we go through and take a harder look at this chemical process along with other new technologies that may be able to be implemented to upgrade the plans at a less expensive number, and hopefully we'll be able to get back to you with some written questions.

Unfortunately, we have another matter to take care of today, and we're going to have to limit your questions before the committee, but let me turn to Arlan Stangeland for any remarks he would like to make at this time.

Mr. STANGELAND. Thank you, Ms. Murcott. Just let me tell you that your testimony is a breath of fresh air.

Ms. MURCOTT. Oh, good. Great.

Mr. STANGELAND. I don't know that I've heard testimony that excites me as much as yours does, and I think it's a classic example of it's time for the bureaucracy in the EPA to get the blinders off, and we've got a financial problem, a real money problem, as far as handling waste in this country in the future, and you can tell them down at EPA that I fully intend to have the amendments drawn that you suggest.

Ms. MURCOTT. Thank you.

Mr. STANGELAND. Either they're going to open their eyes and start to recommend some flexibility to us that solves the problem, or, by George, we're going to do it by law, if I have anything to say about it.

Ms. MURCOTT. Terrific.

Mr. STANGELAND. Beyond that, I have no further comment. I just think it's time we look to the scientific community to tell us how to solve some of these problems and not do things as they have been done for the past 20 years because that's the way we do things.

We can change, and we can take the examples of other countries as to how they've moved to solve some of their problems, and I really appreciate your testimony.

Ms. MURCOTT. Thank you very much.

Mr. NOWAK. Thank you very much for your testimony.

[Ms. Murcott's prepared statement appears on page 505.]

Mr. NOWAK. We'd like to invite now and move on to the second portion of our hearings, which is a hearing concerning Onondaga Lake.

I'd like to invite Senator Moynihan, Senator D'Amato, and Congressman Jim Walsh to take the witness table. I just want to make a brief opening statement.

Onondaga Lake is a 4.5 square mile area which is located in a 240-mile watershed with a population of 250,000 people. Current land use in the watershed is 33 percent cropland, 28 percent urban, 22 percent woodland, and 17 percent open and special uses.

Public ownership accounts for 75 percent of the shoreline, thereby accounting for the high level of public interest in the restoration of this resource.

The story of Onondaga Lake is a classic case of urban industrial development, water pollution, degradation, regulatory administration, and water quality management.

Once the center of recreational and commercial fishing activity, the lake is now highly polluted. Fortunately, rehabilitation and clean-up efforts are now underway, fueled by public interest and environmental concerns, lake shore development, and a change in commercial activity, as well as the very high profile activity of our three witnesses.

On February 14, 1990, Onondaga Lake Management Conference conducted its initial meeting in Syracuse. At today's hearing, we will receive information concerning this conference and other efforts to achieve a thorough and prompt restoration of this New York resource.

We look forward to the testimony of our two distinguished Senators from New York and Congressman Walsh, who represents the affected area.

In addition, we will receive testimony from U.S. EPA and the State of New York, as well as the U.S. Army Corps of Engineers.

Finally, we will receive testimony from a number of citizens representing organizations and interests who are dedicated to the clean-up of the lake.

Senators, I apologize for the rush introductions, but I know you have tight schedules and you've put in substantial time on this matter, and we certainly want to defer to your remarks at the present time.

Senator Moynihan.

TESTIMONY OF HON. DANIEL PATRICK MOYNIHAN, A U.S. SENATOR FROM THE STATE OF NEW YORK

Senator MOYNIHAN. Thank you, Mr. Chairman, Mr. Stangeland. Would you allow me the privilege of introducing our associates here? Senator D'Amato and Mr. Walsh are here representing the Congress, as it were, but we're here actually on behalf of the Onondaga Lake Management Conference, of which we are ex officio members, and for Syracuse it's a rare day when everybody is in town.

Mr. Nicholas Pirro, our County Executive, is here and next to him is Mayor Young, the mayor of the city; we have the very distinct honor of having General Patin with us, General Patin is Division Engineer for half the United States or something thereabouts and with him, Colonel Boyd, who is the Regional Engineer; and Constantine Sidamon-Eristoff, the Administrator of Region II of EPA.

Sir, I can make the case very directly, and I know that Senator D'Amato will wish that I do, as we are very much in session on the other side, and that is we are here to ask authorizing legislation that would correspond to an appropriation already in place and enacted under which we have commenced the Onondaga Lake Management Conference.

Mr. Timothy Mulvey is the Executive Director. We took for our model the estuary conferences which we began about 10 or 12 years ago, where you have a body of water with a set of complaints, but many jurisdictions, in two States typically, and counties and cities and towns.

The body of water involved here is an inland body of water, Onondaga Lake. It feeds into the Erie Canal system and to the waterways eventually into the lake system in St. Lawrence estuary and so forth.

What we have is an experiment. We have, in the one case, this is almost certainly the most polluted body of inland water in the United States.

The Solvay process began about a century ago in Syracuse and all the industrial wastes were simply dumped into the lake in the manner of that time.

Probably a third of the volume of the lake is industrial waste, much of it toxic. How much of it we have to establish. Getting this body of water back into healthy condition is as tough an assignment as will be found.

There are lakes like it, none that I know of Minnesota, you don't allow things like that in Minnesota, but there are lakes like it, and the Corps of Engineers is particularly interested in getting hang of what do you do with one of these things.

We've worked out moving waters, and we've worked out coastal waters, we haven't really taken on a tough lake. But now we want to learn to do with Onondaga what we need to do in all bodies of water all over the Nation.

One of the big questions is what do you do with that industrial sludge? Can you find a way to relocate it or do you cap it?

There's a lot of engineering as well as a lot of science to be done here, and what we ask, sir, is that you authorize it. The money is already there, and it's being spent, and the operation is in place.

We have passed out of our committee your counterpart on our side the authorizing legislation, too. I thank you very much, and I turn to my colleague, Senator D'Amato.

Mr. Nowak. Thank you very much, Senator.

Senator D'Amato.

TESTIMONY OF HON. ALFONSE M. D'AMATO, A U.S. SENATOR FROM THE STATE OF NEW YORK

Senator D'Amato. Mr. Chairman, indeed it's a privilege to be here with you and with our senior Senator, Senator Moynihan, Congressman Walsh, Congressman Stangeland. It's good to be here.

I think the evidence is there that clearly we on the Federal side have a lot of work to do. I believe the local governmental units have put in about $300 million as it relates to efforts to upgrade sewage treatment, et cetera.

It's estimated that restoration of Onondaga Lake will cost anywhere up to about $200 million, about half of that having to come from the federal side, the balance coming from local and state.

This is not an endeavor to shift the responsibility onto the Federal Government. Indeed, if one were to look at the historic development, I think we can make a case that it was as a result of the failure of the Federal Government, going back to 1972, 1973, 1974, 1975, when permitting was under the aegis of the EPA and thereafter coming under the aegis of the state, that we have a very real responsibility.

Now, I would say to you that the EPA, as it relates to monitoring of the permits now and attempting to set up this conference to move forward, is to be commended.

There's talk on their part that they're going to re-evaluate the criteria used to determine a site's eligibility for the National Priorities List, but that's still far off in the future, and it doesn't provide any guarantees that Onondaga Lake will meet the new criteria, therefore making them available for superfund money.

I mean, that may or may not be, and we simply cannot wait, and that's why Senator Moynihan and myself have moved as vigorously as we have.

I know there are others who would like comment, but I'd also like to add an additional point.

We in the Congress have done some, and we're attempting to do more. But thus far it's been the state that's filed the lawsuits seeking the clean-up from the Allied Chemical Company, and thus far it's been the state that has devoted resources to bringing the polluters to justice.

While I have no doubt that this legal action will be forcefully pursued, it's my strong opinion that the Federal Government, and in particular the U.S. Attorney, should become involved in seeking, number one, compliance, and secondly, redress to the wrongs that absolutely took place.

I think that for anyone to suggest that those resources of the Federal Government shouldn't be used in this case, they're in fairyland, and they're wrong.

I've spoken to the U.S. Attorney, and he's prepared to go forward with such a suit. The problem is he can't get the EPA to request that such an action be taken.

Why the EPA is dragging its feet on this matter, of course, is another kind of bureaucratic game. Now, I don't understand how the U.S. Attorney's involvement would do anything but to be helpful as it relates to the prosecution of the polluters and possibly obtaining some funds to help in the clean-up both at the Federal, state and local level.

So I will leave my comments at that. While we are moving in the right direction, much needs to be done, and this authorization is a key, key element, Mr. Chairman, if we have any hope of taking probably the nation's most polluted lake and turning it around and giving the people of all of Central New York a real opportunity to enjoy it, to utilize it.

I think the great prosperity that will flow from that is immeasurable, incalculable, and something I think we're all here to attest to. I thank the Chair and the distinguished ranking member.

Mr. NOWAK. Thank you, Senator. We turn now to Congressman Walsh for his remarks.

Senator MOYNIHAN. Mr. Chairman, would you excuse Senator D'Amato and me? We are in the middle of tumult on the Senate floor, and you are in very able hands with Mr. Walsh.

Mr. NOWAK. Well, let me just thank you for your appearance and for your continued commitment not only to this portion of our State, but to the Great Lakes as well, where we are serving, and we look forward to working with both of you as we draw up what hopefully will be more than technical changes in the Clean Water Act. Thank you very much.

Mr. STANGELAND. Will your participation over there increase or decrease the level of tumult, Senator?

Senator MOYNIHAN. Well, we cancel each other out.

Mr. NOWAK. Thank you again.

Congressman Walsh.

TESTIMONY OF HON. JAMES T. WALSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. WALSH. I'd like to thank the distinguished Chairman of this important subcommittee for holding this very, very important hearing, and I'd also like to thank my good friend and colleague on the Agriculture Committee, Mr. Stangeland.

I don't want to take any time away from the important testimony that will be brought by members of my home community, but I would like to mention just a few points.

We from Central New York know about your role, Mr. Chairman, in bringing Lake Erie back to life, so hope springs eternal for us.

You may appreciate better than most that Onondaga Lake is not simply a parochial concern; it flows directly into Lake Ontario and the St. Lawrence seaway.

We in Central New York take the clean-up of the lake as our responsibility, but we do need help. A clean lake has become an important goal for us.

It has become an environmental focus for us, and we are working as partners, public and private sectors together. You will hear from some of our partners today, and I don't want to take any time away from them, so I will end here, but I would like to say once again thank you for this opportunity to give us an opportunity to come in.

Mr. NOWAK. Well, thank you for your persuasion to not only hold this hearing, but to be so involved in this process, and we'd be happy to invite you to come up and join us as we go through the rest of the testimony.

As I know, you will be a big part of any further action we take on this matter, so if you'd like to come forward, we'd be happy to have you.

Mr. WALSH. Thank you, sir. I appreciate that courtesy, and I'll take advantage of it.

Mr. NOWAK. We'd now like to invite before the committee the Mayor of Syracuse, Thomas G. Young, and Nicholas J. Pirro, the Onondaga County Executive.

Gentlemen, if you'll take your seats, and, mayor, if you'd like to proceed with your testimony. I just mention that your formal testimony will be incorporated totally in the record.

TESTIMONY OF HON. THOMAS G. YOUNG, MAYOR, CITY OF SYRACUSE

Mayor YOUNG. Thank you very much, Mr. Chairman and Congressman Stangeland. May I say off the record that it's a privilege to be testifying before one of the all time greats of the Little Three.

Mr. NOWAK. Not very many people know about that, but we did beat Syracuse three times.

Mayor YOUNG. I happen to be a St. Bonnie's enthusiast, but I'd like to talk to you about the talents of some of those others.

In the interest of your time, Mr. Chairman, and the interest of others to testify before you, I'll simply ask that my formal remarks be made part of the record.

Mr. NOWAK. Without objection, so ordered.

Mayor YOUNG. I guess I would offer this. I was in Albany yesterday, and I was with Governor Cuomo and a group of elected executives throughout the state, where we endorsed the States environmental bond issue, $2 billion, as you know, is the amount for this November, and in suggesting why I was especially encouraged and interested in the bond issue, I told the story of a visit I had made earlier yesterday morning to an elementary school in Syracuse, seventh-graders at Lincoln Junior High.

They had a bunch of questions that they asked, one of which was this. Mayor Young, do you really believe that the Federal Government, state government, and your office can clean up Onondaga Lake?

As I thought about that on the drive to Albany, I said to myself it's an awful statement to have kids of that age of 12 or 13 years old possessed of such cynicism about the behavior of past generations of Syracusans.

So it's for that reason that I urge that you consider the fact that we bear responsibility of the sins committed by past generations of Syracusans.

In my mind, we can't afford to have future generations of Syracusans say that in 1990 the partnership known as the Federal System, the Congress, the President, the state and local governments, committed those same sins.

I would like to urge you to authorize this legislation and the appropriation in the interest of generations yet born. It's critical to us, it's an opportunity, perhaps the last best hope, the legislation before you, our last best hope to redeem the sins of those generations who have gone by and to make our own future for the good of Central New York, for the good of the State of New York, and indeed for the good of the northeast of the United States.

I thank you for indulging my time, and, Congressman Stangeland, at the risk of any irritation, I want you to know that we in Syracuse think highly of Minnesota every day of the year except this coming Friday night.

[The prepared statement of Mr. Young appears on page 594.]

Mr. Nowak. County Executive Pirro.

TESTIMONY OF NICHOLAS J. PIRRO, ONONDAGA COUNTY EXECUTIVE

Mr. Pirro. Thank you very much. I will not bet any of this on the game on Friday night. Let's hope it's a good one.

I'm very pleased, Congressman, to join the subcommittee today as we present our testimony, and on behalf of the Onondaga Lake Management Conference, which I have the privilege of chairing in its inception, and on behalf of all the people of Central New York, we're here to thank you for the opportunity to tell you how much cleaning up Onondaga Lake means to our Central New York environment.

We also believe it really goes beyond that. Undertaking this project will send an important message to every corner of this great land that we are committed as a nation to writing a tremendous environmental rock.

You should also know how much I personally, and the community at large, appreciate what your colleagues who represent Central New York have done to increase our hope and help advance the project through the legislative process.

Creation of the Lake Management Conference and the approval of $500,000 to begin studying the lake is certainly a welcome first step.

At our organizational meeting, the presence of Senator Moynihan, Governor Cuomo, Congressman Walsh, Mayor Young, representatives of the DEC and the EPA and other participants, left no doubt that individuals at the highest levels of local, state and Federal Government were of one mind, restoring Onondaga Lake.

It is our belief that the United States Government has a responsibility to help fund the cleaning of the lake inside New York State.

Without taking too much time or attempting to go into details better left to further speakers and the scientists, I will tell you why I believe in the necessity of Federal financial involvement.

Onondaga Lake is a multi-jurisdictional body of water. It is part of the navigable inland waters and connects Central New York with the Great Lakes and the world.

Thus, it falls under multi-jurisdictions, Federal, state and local. We maintain that for this reason the lake's remediation and management requires multiple levels of Government intervention.

Described as the most polluted lake in North America, the waters of Onondaga Lake are a major source of pollution of the entire Seneca-Oswego River system, the largest tributary of Lake Ontario.

You can see that by halting the following of these rivers, we would derive the direct and immediate benefit of improving Ontario Lake water quality, the goal of the U.S.-Canada Great Lakes Water Quality Agreement.

We cannot think of Lake Ontario as merely a boundary. It is a major economic and environmental resource for our region. It is Onondaga County's major drinking water supply.

That water supply has also drawn two major breweries to our state and our area, and this high quality water is an international asset for fishing, swimming, boating and economic development.

It's ironic how economic development can be both the reason to protect a natural resource and an excuse to ruin it. Perhaps no other United States body of water has been exposed to such a variety of pollutants from such a diversity of sources for such a long period of time.

A century ago, when our natural resources seemed boundless and when environmental science was unheard of, our forefathers traded jobs and payrolls for the pollution that destroyed the lake.

People call Onondaga Lake a cesspool; yet although you wouldn't want to take your family on a picnic at a cesspool, more than 600,000 people used Onondaga Lake Park last year.

A county facility virtually encircles this lake. Eighty percent of the lake shore is publicly owned, thus ensuring that when it is clean, the lake will be preserved as one of the few public metropolitan water resources in the country.

Onondaga Lake has played a role in a number of national events, including the U.S. Olympic Festival, the National Intercollegiate Rowing Championships, the Pan American Rowing Trials, the National Hydroplane Circuit Racing, the U.S. Junior Olympics, and in 1991, the U.S. Senior Olympics will use the lake and the surrounding park.

Even those not at optimistic as I about the lake will agree that improved water quality can only lead to additional national and international sporting events.

We do not come here saying you, the Federal Government alone, should pay. We have already made a substantial financial contribution since 1972, spending well over $310 million in Federal, state, county and private money.

We are beginning to see improvements in water quality, but continuing waste bed leachate and the problems associated with our antiquated sewer system means pollution remains an ongoing troublesome problem.

Your help can result in stopping the pollution that continues to enter the lake, while allowing us to begin the massive task of remediating this body of water from the chemicals on the floor to the bacteria near the surface.

In our estimation, remediation is possible. We say that based upon our progress to date. No longer is the lake characterized by floating gobs of decaying algae, debris and sewage.

Now the bacterial levels are down, lake transparency is at an all time high, and ecologically diverse zooplankton populations are now present and beginning to thrive.

Private developers see the potential. The largest mall in the northeast is being constructed on the south shore. A few blocks away, the old factories are being turned into restaurants, shops, housing for the elderly, and offices.

Our lake advisory group is talking about re-establishing the Atlantic Salmon, the king of freshwater fish that once flourished here.

Yes, the goals are ambitious. We join with our optimistic Federal representatives who believe, as we do, that our vision can become reality, an Onondaga Lake that is swimmable, fishable and even drinkable in our lifetime.

I invite you to visit our community, see our lake and its potential. We believe once you understand that this lake where Hiawatha once roamed is a national resource worthy of your consideration, you, too, will view it with the same commitment and fervor as Senators Moynihan, D'Amato, and Congressman Walsh.

In closing, I want to again express the gratitude of all the people of Onondaga County who care about the environment for what you have done so far.

I ask for your continued support to help us rewrite history by rejuvenating and restoring Onondaga Lake and thus returning it to the people. Thank you very much.

Mr. NOWAK. Thank you very much, Mr. Pirro.

[Mr. Pirro's prepared statement appears on page 528.]

Mr. NOWAK. We have, unfortunately, a vote on the floor which will cause us to leave in a few minutes, but before we go I want to express the committee's, concern about this type of situation, and as we're going through all the other water resources in the country, we're finding pockets of the same general type of especially contaminated bottom sediments, which for a long time were out of sight, out of mind.

However, the depletion of the resource because of those bottom sediments is becoming more and more apparent as we've got technology and we've got other impacts that we can now see and feel and, in some instances, smell and touch.

Water resources that are drawing people to live, to recreate all over the country, are really being looked at in completely new terms than we did 20 or 25 years ago.

As you're taking your local office's responsibilities, these are new kinds of very, very tough problems to handle, and we're struggling through a period where I don't think we're really at the state-of-the-art in technology to solve those problems in any short time frame.

Unfortunately, we're seeing all over the country a great impatience, and yet we know that we have made some progress in cleaner lakes and cleaner waters over the last 20 years since the water pollution bill came into being.

Now we've got initial clean-ups that were made for the conventional pollutants. Now we've got the tougher problems to look forward to, and we have to, as we developed technology to cure those conventional pollutants, now we're looking at the tougher problems that you're faced with in Onondaga Lake and, as I said, in many other areas of the country.

So we're looking to the kind of cooperation that you're presenting as local leaders to really invigorate thinking and providing an information base for people so that the State and certainly the Federal Government can react, too.

I applaud you for all of the efforts that you've made, and we'll certainly be coming back to you shortly with perhaps some questions as we develop the response.

But I really want to congratulate your efforts, both of you, for putting together and managing this Lake Management Conference, as it's called, because I think it's appropriate for many, many other areas in the country, and we look forward to working with you on this matter as we receive the other testimony and start to develop a response and a federal kind of presence.

Let me turn to Arlan Stangeland for any brief comments he would like to make.

Mr. STANGELAND. Thank you, Mr. Chairman. I'll be very brief.

We welcome you here. Certainly, you've got a very excellent pair of allies in Senator Moynihan and Senator D'Amato.

I have a particularly deep interest in the Clean Lakes Program and making sure that where we have polluted lakes that we move toward a responsible clean-up of those and then prevention in the future and even more aggressive prevention in the future than we've had in the past to protect those great resources that we have.

So I have no real questions. I have to say I'm not very familiar with the whole problem of the Onondaga Lake, and I'm waiting for the rest of the testimony to get a better handle on it.

All I have to say about Friday night is that I understand they're two pretty good basketball teams, but it's like, from what I read in the paper, David going after Goliath, and I'm just hoping that the Gophers are sharpening up there with their slingshots.

But whoever wins in that one, Detroit, Michigan, is going to look pretty darn good.

Mr. NOWAK. Thank you, Mr. Stangeland.

We will be, as I stated, developing positions, and we'll get back and be in contact with you, both through Senator Moynihan and certainly Congressman Walsh, and hopefully we can make significant progress in the near future. Thank you for your attendance.

The committee will stand adjourned for approximately 10 minutes while we vote and return for the rest of the witnesses.

[Recess.]

Mr. **Nowak**. The subcommittee will come to order. We have on the witness panel now Brigadier General Jude W. Patin, Division Engineer, North Central Division, Army Corps of Engineers, and he's accompanied by Colonel Hugh Boyd, District Engineer, Buffalo Corps of Engineers.

Gentlemen, if you'd like to present your testimony, your statements, of course, will be recorded completely in the record.

General.

TESTIMONY OF BRIG. GEN. JUDE W. PATIN, DIVISION ENGINEER, NORTH CENTRAL DIVISION, U.S. ARMY CORPS OF ENGINEERS, ACCOMPANIED BY COL. HUGH BOYD, DISTRICT ENGINEER, BUFFALO CORPS OF ENGINEERS

General **Patin**. Mr. Chairman and members of the subcommittee, my name is Brigadier General Jude Patin. I'm the Commanding General of the North Central Division of the U.S. Army Corps of Engineers.

It is my pleasure today to make this first appearance before your committee and to discuss our reconnaissance study of Onondaga Lake.

With me from my division are two individuals who are intimately involved in the development and execution of this study.

They are Colonel Hugh Boyd, the Buffalo District Engineer, and Mr. Dave MacPherson, the Onondaga Lake Study Manager.

This afternoon, our report will present a brief overview of Onondaga Lake, our authority, the process we use in the corps for studies of this type, and the status of our current efforts regarding Onondaga Lake.

First, I should reiterate the Army's position on the situation at Onondaga Lake. This position was included in the Army's letter report on S. 2183, which was provided to Congress on March 21, 1990.

It has been the Administration's position that clean-up of Onondaga Lake is not an appropriate function of the Federal Water Resources Development Program.

There are already a number of federal programs designed to address waste water clean-up, and clean-up of Onondaga Lake should be pursued under these programs, not under a special program authorization.

Now, let us take a look at Onondaga Lake. First, it's location and size. Onondaga Lake is located adjacent to and northwest of the city of Syracuse, New York.

The lake is approximately one mile wide by four and a half miles long by 60 feet deep. It empties into the Seneca River, which flows north into the Oswego River, which flows into Lake Ontario.

Eighty percent of the shoreline of the lake is publicly owned. The Syracuse area has a population of 450,000 and has traditionally supported the heavy industries of steel and chemical production.

The heavy industry has declined and has been replaced by light industries of dairy products and testing laboratories. Syracuse University also remains a large employer in the area.

The water quality of the lake severely limits the recreational opportunities. There is no swimming permitted, and the fish are not edible.

There are extensive mercury and calcium contaminants which adversely affect any efforts of the lake to clean itself.

The waste water effluent problem has considerably improved with the addition of a secondary treatment plant, but the combined sewer overflow limitation continues to result in contaminated effluents during storms.

Mr. Chairman, the June 1989 resolution of the Senate Environmental and Public Works Committee gave the corps authority to perform a study to determine what improvements in the interest of water quality and environmental enhancements are advisable for Onondaga Lake from a federal perspective.

Funds in the amount of $250,000 were included in the fiscal year 1990 Energy and Water Development Appropriation Act for the corps to initiate the study.

We take on these types of assignment by following a system approach, as shown on this chart. In the reconnaissance phase, we endeavor to define the problems and identify opportunities; identify potential solutions to the problem and ways to realize the opportunities; determine benefits, costs and environmental impacts on the various alternatives; determine if further study meets administration program requirements; provide an estimate of the time and cost for the next system activity, which we call the feasibility phase; and determine if there is a non-federal interest willing to share the cost of further study.

We proceed to the feasibility phase only if we identify at least one potential solution that will likely have Administration support and be supported by a cost sharing non-federal sponsor.

In the feasibility phase, we further analyze the alternatives, identify the project from the alternatives, and complete the environmental documentation.

For Onondaga Lake, Congress has provided funds for the reconnaissance phase, so let me review for you our actions on this initial phase of the study.

The Buffalo District has established an interdisciplinary team of qualified environmental engineers, biologists, economists and others to perform the various aspects of the study.

Coordination meetings have been held during the past months with representatives from other Federal, state and local agencies to gather data and coordinate previous study efforts.

In February, we participated in a workshop which brought together experts from all over the world to review and discuss the Onondaga Lake contamination problem.

On February 14th of this year, I participated, along with Senator Moynihan and Governor Cuomo, of New York, in the initial meeting of the Onondaga Lake Management Conference.

Colonel Boyd and his staff recently participated in a follow-on working level management conference on 16 March in Syracuse during which appointments to the Technical Advisory Committee and the Citizen Advisory Committee were discussed.

We have set the following objectives as critical to the successful accomplishment of this reconnaissance phase: Define the extent of the water quality problem and identify potential solutions; identify opportunities for providing environmental enhancement; determine the extent of Administration policy support for a federal role in implementation; estimate the feasibility phase time and cost for both federal and non-federal participants; and assess non-federal interest and support.

A scope of work has been prepared which outlines the individual tasks and schedule. These individual tasks are shown on this chart.

The Buffalo District anticipates completing these tasks on the chart and tasks of the reconnaissance study in May of 1991.

In closing, let me restate that clean-up of Onondaga Lake is more appropriately addressed under existing Federal programs for waste water clean-up.

The corps is available to offer its expertise on a reimbursable basis.

Mr. Chairman, this concludes our statement. I'll be happy to answer any questions or comments that you or members of the subcommittee might have at this time.

Mr. NOWAK. Thank you very much. When we look at the step from recon to feasibility, it would be at the conclusion of the feasibility that a cost benefit would be established in your normal process, would it not?

General PATIN. Yes, sir.

Mr. NOWAK. During your reconnaissance, that is anticipated to be completed by what date now?

General PATIN. That's May of 1991, sir.

Mr. NOWAK. The DEC, I understand, of New York State has already done some testing. Is all of that information available to you?

General PATIN. Yes, sir.

Mr. NOWAK. You have the complete categories of what contaminants were found?

General PATIN. Yes, sir. Part of the coordination that's going on right now is ensuring that the data that's been developed is made available so that that data can be incorporated in the reconnaissance study and the effort that's going on.

Mr. NOWAK. Can you tell the committee at this stage if there are certain areas that have received the majority of the contaminants, if they're presently in a physical area that can be identified?

General PATIN. I'm not sure, sir, if I understand. Would you repeat that?

Mr. NOWAK. The contaminants of mercury and so forth have been identified, and I'm wondering if there's associated with that identification an area, if we could call it an area of concern, where those contaminants are on the bottom of the lake.

We're talking about an area of 4.5 miles by one mile by 60 feet deep, and I'm just wondering if there's a concentration of those contaminants that came from a particular pipe or a particular source.

General PATIN. I understand, sir. At this time, we have not been able to identify a particular area or specify an area that has a predominant sediment, and that's going to certainly be an aspect of the study that will allow us to make some decisions from, so that's something that we're very much in pursuit of, trying to identify what's there and where it's at, but at this time, no, sir, we haven't.

Mr. **Nowak**. But that will be a part of the recon analysis?

General **Patin**. Yes, sir.

Mr. **Nowak**. You'll be able to identify those through that phase of your work?

General **Patin**. Yes, sir.

Mr. **Nowak**. I mention that because as we look at this particular problem and others that have been brought to my attention, we perhaps can make significant progress if we can find, you know, an appropriate technology to start treating some of that contaminated soil.

If it's limited to specific areas and does not in heavy amounts cover the whole lake bottom, so to speak, the cost of that clean-up may be greatly reduced in looking at what you'll finally come up with if we get to the feasibility stage and the cost benefit.

General **Patin**. Yes, sir. It will also give us the capability to identify how might we address that, how might it be removed and the most economic process.

Mr. **Nowak**. We have supported from this committee, and I think the Corps is also participating, cleanup outside of the navigation area in Waukegan Harbor—a project that is now under demonstration to pull out certain PCBs and separate the oils and tars from the soil.

The initial findings, of course, were that they had some success in the destruction of that through a high burning process, and I'm wondering if the technology that has been used there could not be used in other places not only in the Great Lakes, but certainly in an inland lake like this where you have specific limited areas.

General **Patin**. Yes, sir.

Mr. **Nowak**. The study is just really getting started in terms of the expenditures of that money, I would assume. Are we doing it within house or will some of that be given out to third party contracts? Do you know?

General **Patin**. That $250,000 that we have will be used in-house in Colonel Boyd's district, so that amount will strictly be retained in-house.

Mr. **Nowak**. You make the statement that you believe at this stage of your study information base that Onondaga Lake is more appropriately addressed under existing federal water programs for waste water clean-up, and I'm wondering as you move forward with this study and the recon phase if that position could change, depending upon the outcome of the results of your analysis as you move forward.

General **Patin**. I would think that that position might not change. There are programs that are available to address this type of problem, and as I see it, at this point, I would not envision that that statement might change.

I would say though, that we would be available to support this on a reimbursable basis.

Mr. **Nowak**. The information that you're receiving, is that being coordinated with the planning management group that has been set up by the local officials and the State?

General **Patin**. Yes, sir.

Mr. **Nowak**. We may have, after hearing some of the other witnesses, some further questions as we go into this, and, as you know, we are looking forward in the future to using appropriate Corps expertise in these areas to develop more in-depth kinds of programs and perhaps even look at a future consolidation of some of the water and the clean-up responsibilities and joining with EPA and other federal agencies to make the most efficient use we can of the expertise that is in the corps.

We would hope that your analysis goes as deep as your knowledge and environmental people will take it.

General **Patin**. Yes, sir.

Mr. **Nowak**. I have no further questions then, and we will, however, keep the record open on this particular matter and try to fill in any gaps that we find after review of all of the testimony, and we'll get back to you.

I want to thank Colonel Boyd for his cooperation in this matter as we move forward. Thank you very much.

Yes, I'm sorry. Mr. Walsh.

Mr. **Walsh**. Thank you, Mr. Chairman. Just a couple of questions.

General Patin, in your opening statement, as the Chairman suggested, it's been the Administration's position that clean-up of Onondaga Lake is not an appropriate function of the Federal Water Resources Development Program, and the Chairman asked the question if you thought that you might discover anything in your reconnaissance phase that would bring about a change in that position.

What facts, in your experience, would cause a change in the Administration's position?

General **Patin**. The position might change if we would determine that there are some navigational benefits or that there are some flood control benefits.

If things surface during the analysis, that would probably enable that statement to change somewhat.

Mr. **Walsh**. General, are you aware that there's a flood control study being undertaken in that Seneca-Oswego River system upstream from the lake now?

General **Patin**. I am not aware of it, but I can imagine that there could be one going on.

Mr. **Walsh**. Two other brief questions. One is, in your reconnaissance phase, will that encompass the entire watershed of the lake?

Mr. **Patin**. That will cover the entire watershed of the lake, as well as some portions of the outlets, because we do need to examine to some degree what's there.

Mr. **Walsh**. Okay. Will you identify inputs, both point and nonpoint pollution sources, in that study?

General **Patin**. Yes, sir.

Mr. **Walsh**. All of them?

General **Patin**. Yes, sir, we will endeavor to do that.

Mr. **Walsh**. The Chairman also asked about the data that's been gathered by DEC, New York State Environmental Department.

A great deal of other data has been accumulated over the years. Are you being made available that data also?

General **Patin**. Yes, and that's a very important aspect of the study, and we are putting maximum emphasis on that, because it is extremely important to gather the information that's already been collected, because it's good data and it will certainly expedite the reconnaissance process as well as reduce the cost.

Mr. **Walsh**. Very good. Thank you, General.

Thank you, Mr. Chairman. I have no further questions.

Mr. **Nowak**. Thank you very much, and we'll keep the record open, as I've said.

[General Patin's prepared statement appears on page 522.]

Mr. **Nowak**. We would now like to invite Mr. Sidamon-Eristoff, Regional Administrator, Region II, Environmental Protection Agency, to the witness table, and we'll be happy to receive your testimony into the record and let you proceed as you may desire.

TESTIMONY OF CONSTANTINE SIDAMON-ERISTOFF, REGIONAL ADMINISTRATOR, REGION II, U.S. ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY ERIC SCHAFF, CHIEF, NEW YORK AND CARIBBEAN SUPERFUND BRANCH; AND KEVIN BRICK, DEPUTY DIRECTOR, DIVISION OF WATER MANAGEMENT

Mr. **Sidamon-Eristoff**. Thank you, Mr. Chairman and Congressman Walsh.

I'd like to introduce the people that are with me. To my left is Eric Schaff, who is the Chief of the New York and Caribbean Superfund Branch of our Office of Regional Council for EPA, and to my right, Kevin Brick, who doubles as the Deputy Director of our Division of Water Management and also is the Program Manager for the Niagara Frontier, and I believe you probably have met him before, because he's been in your area often.

My name is Constantine Sidamon-Eristoff, and I am the Regional Administrator of the U.S. Environmental Protection Agency, Region II.

Our region includes the States of New York and New Jersey, Puerto Rico, and the U.S. Virgin Islands. I am very pleased to be here today to discuss EPA's activities regarding Onondaga Lake and the efforts underway to restore the lake.

In the interest of not boring you all with what you have already heard, I'm going to skip a little bit of what I was going to say in description of the lake itself.

I think you have now got a very good idea as to some of its problems. I would like to say, however, that the lake, which is not a drinking water supply, as you have heard, because of its solidity, is also high eutrophic, and the excessive phosphorous levels and resultant phytoplankton blooms persist despite a ban on phosphorous detergent which has been in place for several years.

Since the 19th century, as you have also heard, Onondaga Lake has been affected by various pollutants, the Solvay soda ash plant, the Allied Chemical coal tar extraction facility, the oil city tank farms, the Syracuse Metro Sewage Treatment Plant, and numerous combined sewer overflows.

Despite the 1986 shutdown of Allied Chemical, the leachate from its Solvay process waste beds continues to affect the lake.

In addition, the lake has been affected by mercury contamination of the sediment, which is the result of past industrial waste disposal methods.

Mercury, as you know, is a chemical element. You cannot burn it or get rid of it that way. It stays. It has resulted in the placement of Onondaga Lake on the New York State Department of Environmental Conservation's register of inactive waste sites.

DEC, the Department of Environmental Conservation of the State of New York, did complete an extensive investigation of the sediment contamination to determine the federal hazard ranking system score for possible inclusion on the Superfund National Priority List.

As a result of this investigation, the lake did not receive a high enough score to be included on the NPL at that time; therefore, there is no present direct federal superfund involvement in the lake.

The State of New York, in June of 1989, filed an action against Allied Chemical seeking remediation and damages. The State also issued two administrative orders on consent for remedial investigation and feasibility studies for most of the area immediately surrounding the lake and is negotiating a third party consent order for a specific Allied facility near the lake.

Normally, EPA does not monitor such State enforcement activities. However, because of significant interest in the lake by many parties, EPA is monitoring the state's progress to determine whether there is need for federal involvement.

In this regard, on December 13th of last year, the State very firmly indicated that due to its enforcement activities, any legal action by EPA would not be needed or beneficial, and we accepted that.

Under the Clean Water Act, EPA and New York State have concurrent enforcement authorities, and EPA will continue its ongoing coordination with New York State in these enforcement efforts.

EPA will continue to review the performance of municipalities and corporations on or near the lake to assure compliance with the Clean Water Act.

At present, there is no significant non-compliance with regard to direct discharges to the lake. The EPA, since its inception, has been involved through the State in the efforts to restore the lake.

A total of over $225 million in federal funds was awarded between 1957 and 1988 toward sewage projects in the Onondaga area.

Some $215 million of these funds were awarded since 1970, when EPA became an independent agency. The Construction Grants Program has, over the years, produced the raw sewage loadings into the lake and thus reduced somewhat the bacterial contamination, nutrient levels and biochemical oxygen demand loadings.

There are still significant combined sewer overflow loadings to the lake. EPA also provided funding in 1976 and in 1980 under section 208 of the Clean Water Act.

These funds enabled the Central New York Regional Planning and Development Board, the designated 208 Water Quality Management Agency, to develop a water quality management plan for the area.

The plan was certified by the state in 1981 and approved by EPA. It identified the programs necessary for point source controls, management of non-point source pollution, and the institutional and legislative means to restore and maintain the lake.

The 208 program identified the need for a more comprehensive management plan and method for coordinating the pollution control programs.

Since 1983, EPA has provided funding to the New York State Department of Environmental Conservation under sections 106 and 205(j) grants to implement the activities in the State work plan for the Onondaga area.

In 1986, using these funds, the State funded the Central New York Regional Planning and Development Board to develop a preliminary lake and watershed management plan.

Once completed, it was determined that additional work was needed to develop specific recommendations. Presently, using DEC and EPA funds, the Planning and Development Board has undertaken a program to perform this work expected to cost over $1.4 million.

About $552,000 of that is EPA section 205(j) and section 106 money. Additional EPA monies are being passed through by the state to the Planning Board under the authority of section 205(j) of the Clean Water Act as amended.

In 1989, the state applied for section 314 clean lakes funding to perform a phase one diagnostic and feasibility study of the lake to compliment the work already underway.

As required by EPA, the state submitted a priority list with its seven applications for this funding. The Onondaga Lake project was placed fourth on this priority list, which was regrettably not high enough to receive funding.

However, the conference report for the fiscal year 1990 EPA appropriations bill provided $500,000 for the Management Conference for Onondaga Lake, of which you have heard.

The language of that provision reads "the conference shall develop a plan that identifies corrective action and compliance schedules for clean-up and coordinates implementation of the plan by members of the conference and others."

A further purpose of the Management Conference is to serve as a coordinating body for all other ongoing lake clean-up work to ensure that each work item is consistent with the management plan and with each other and is not duplicative.

EPA Region II's office recently received the formal grant application for the clean lakes funds from the state on March 14, 1990, and has submitted it to EPA Headquarters for approval.

Once Headquarters provides the commitment notice, the region can process the grant and award the funds to the state, and they can then be made available to the Management Conference.

As you know, the Management Conference members include EPA, the Governor of the State, the Army Corps of Engineers, the State Attorney General, Onondaga County, and the city of Syracuse, and the conference is being structured generally along the lines of the EPA's National Estuary Program and will include both scientific and citizen committees.

The Management Conference was convened for the first time on February 14th; our opening session was presided over by Senator Moynihan and by Representative Walsh.

The governor attended and stated that New York State had strong backing for the conference, as did representatives of the city and the county, as well as General Patin.

I represented the Administrator, William Reilly, and on his behalf I stated that the clean-up of Onondaga Lake is a high priority for EPA, and I added that the conference would be very much a cooperative venture involving all three levels of government.

I endorse the need for strong involvement by the public and by the scientific and academic communities in the process. I also pointed out that EPA is already working cooperatively with New York State on enforcement activities related to lake clean-up and that we had agreed that the State would assume the lead on those activities.

The second meeting of the Management Conference was held on March 16th; the agenda included the status of conference funding, a discussion of the staff, confirmation of the job description and salary for the Management Conference's Executive Director, appointments to the Technical Advisory Group, a report on the status of appointments to the Citizens Advisory Committee, and an update from the Corps of Engineers on its reconnaissance study.

I appreciate the opportunity to discuss EPA's views on Lake Onondaga. The clean-up of Lake Onondaga will be a technically difficult and lengthy process which must be carefully and deliberately thought through.

It's a real test, in my view, for government at all levels to see whether this lake can be, in fact, and I believe it can, properly cleaned up.

I think it is a test which we must not fail. Thank you for the opportunity to be here with you today, and I will be glad and pleased to answer any questions which you have.

Mr. NOWAK. Just a couple of questions before we turn questions over to Mr. Walsh.

When the request for study under section 314 was sent to you by the state, how many of those seven were funded? Do you recall?

Mr. SIDAMON-ERISTOFF. We think it was two or three. We can find out and get you the number.

Mr. BRICK. Two. The answer is two.

Mr. NOWAK. The answer is two. So three and four, which would have been Onondaga Lake, were left off the list. I assume a new list was sent recently. Is that correct? For 1990 funding?

Mr. BRICK. I haven't seen the list, no, but we are funding the Onondaga Lake Management Conference with the special funds, the $500,000 that was mentioned.

Mr. NOWAK. That's separate from the Clean Lakes Program, though, so if you were to fund some of the activities from the Clean Lakes Program, you could bring a greater impact upon this problem. Is that true?

Mr. SIDAMON-ERISTOFF. Let me say this. Obviously, $500,000 will get things started, and if we can coordinate well with the Corps of Engineers, which I believe we can, and which the Executive Director of the conference will be able to do, we can at least get a start on the very careful work that needs to be done.

Obviously, the need for additional monies will always be there, but at this moment, I can't give you an answer as to whether or not the State has specifically applied or submitted next year's list in that regard. I will get you an answer, though.

Mr. NOWAK. Well, it's my understanding from the testimony that the EPA Region Office just received the formal grant application for the Clean Lakes Program from the state on March 13th, and you're going to be submitting that to EPA Headquarters for approval.

You know, the obvious question is where is Onondaga? What priority did the state attach to it, and is it high enough to be reached on this round of consideration?

Mr. BRICK. Congressman, that application was specifically for the $500,000 for Onondaga Lake. It was received on the 14th of March, and it was transmitted to Headquarters on the 19th of March with the request that Headquarters transmit the funds to the region so that we can obligate them. That's the status of that particular action.

Mr. SIDAMON-ERISTOFF. In other words, there was no additional ranking. That was a specific request by the State for this specific money.

Mr. NOWAK. Was that the same application or the same form that was submitted in 1989?

Mr. BRICK. No, Congressman. The application that was submitted was the application related to the formation of the Management Conference and the functioning of the Management Conference.

That was the one that was submitted on March 14th. It's different than the application that was submitted last year.

Mr. NOWAK. What did the application that was submitted last year contain?

Mr. BRICK. It was more of a technical proposal. I don't know the details beyond that.

Mr. NOWAK. That has not been resubmitted. In lieu of that, you're telling me, the submission is for the $500,000 for the Management Conference to proceed?

Mr. BRICK. That's correct. I understand that the State of New York may also have an application for Onondaga Lake, but I'm not familiar with the details of that at this point.

Mr. NOWAK. All right. Congressman Walsh?

Mr. WALSH. I thank the Chairman.

I think the questions that the Chairman began are very appropriate. I remember we were in touch with the state regarding their request and their prioritization of lakes, and it struck me as rather odd that a lake that is known, and has been claimed and no one seems to want to challenge that claim, as the most polluted lake in North America, perhaps even the world, would not be number one on that list of polluted lakes in the state.

My office was in touch with the state on that prioritization. I believe Lake Champlain and the Hudson River might have been the top two on the list, but as far as the new list is concerned, Mr. Chairman, I believe you're right.

That either has come out recently or will be out soon, and hopefully this lake would receive a higher priority. My question to the Regional Administrator is when Onondaga Lake was competing for the National Priority List under the superfund, was it competing with actual toxic waste dumps? Is that what it was competing with?

Mr. **Sidamon-Eristoff**. It was ranked according to EPA standards by the state, and the EPA reviewed that. The ranking was not sufficient under the requirements of the NPL at that time.

As I recall, the line was at the number, which is an arbitrary number, called 28.5, but this ranked about 20 something, just a number.

In other words, it was considerably below, and as I understand it, the real reason was the weight that the drinking water requirement had on the NPL measurement program at that time.

In other words, since Lake Onondaga was not used for drinking water purposes, it received a relatively low ranking and did not warrant or didn't rate classification at that time.

Mr. **Walsh**. Were there other bodies of water that were included in that NPL list?

Mr. **Sidamon-Eristoff**. Very few, if any.

Mr. **Schaff**. Congressman, there aren't any sites that are like that, a 4.5 mile lake by one mile. We have the Hudson PCBs site, which you may be aware of, that is somewhat analogous, and we have some sites that approach that, but there is one point that might bear raising right now.

The ranking system is not a competitive ranking, per se. It's more of an objective ranking with a series of criteria, and, as Mr. Sidamon-Eristoff just said, when it was measured against that series of criteria, it did not come up to the 28.5 score, in fact, it ranked between 20 and 21, and therefore it's not really in competition, per se, with other types of sites. It's more of an objective kind of classification.

Mr. **Walsh**. What I'm trying to clear up in my own mind, and if you could help me, the sediments are what were used to compare in this universe of toxic areas, only the sediments. Is that correct?

Mr. **Schaff**. Congressman, I'm not sufficiently familiar with the details of how that test is worked to be able to answer that.

Mr. **Walsh**. Okay.

Mr. **Schaff**. I suspect that's probably not true, though. As Mr. Sidamon-Eristoff was indicating before, one of the anomalies of the present hazard ranking system, in fact, one of the things that's being amended right now, hopefully in the new hazard ranking system which we expect coming out sometime this summer, is the fact that the present one weighs very heavily not so much sediments but the use of the water body for drinking water and proximity to drinking water sources.

For instance, if there was a drinking water intake in the lake, it would undoubtedly have ranked much higher, so I'm speculating now, and I apologize for that, but it is very likely that it was more than just the sediments.

It is probably the other factors as well that were involved.

Mr. **Walsh**. Just one last question. You may have to guess, you may know, but you mentioned potable water. While the lake itself is not potable, downstream of the lake, the Seneca and Oswego River basins enter Lake Ontario in the city of Oswego, and just outside the city of Oswego is the intake for the Onondaga Water Authority, so the effluent flows just past that potable water intake. I'd like to have that on the record.

Mr. **Schaff**. That is right.

Mr. **Walsh**. Thank you very much.

Mr. **Sidamon-Eristoff**. Thank you.

Mr. **Nowak**. We have some other questions that we're going to submit to you in writing. I wanted to give the others the opportunity to testify before we start the next day here, but let me ask a couple of questions.

We talk in terms of what has been done and the $255 million which has been sent to the jurisdiction to construct certain sewer treatment facilities, and I take it that that has had a favorable impact upon the total pollutants coming into the lake, and I would assume that all the non-point sources have been eliminated coming into the lake, except for the CSO problem.

We had significant testimony this morning concerning the rehab of that problem in several areas of the country, and I wonder if you have any information you could give us as to the impact of the CSOs on this lake loading.

Mr. **Sidamon-Eristoff**. Well, I'm going to ask Kevin Brick if he would comment on that one.

Mr. **Brick**. The combined sewer overflows are definitely a significant source of pollution in Lake Onondaga.

Mr. **Nowak**. Does significant mean over 50 percent?

Mr. **Brick**. I don't know what the exact figures are, but I think for different pollutants, I think in particular for pathogens and coliforms, they are a very significant contributor and a cause of bathing beach closures.

The combined sewer overflow problem is apparently being addressed under the terms of a judicial order with Onondaga County, and the plaintiffs are the State of New York and the Atlantic States Legal Foundation.

I think under the terms of that judicial order, there will be produced a plan to deal with the combined sewer overflow problem.

Mr. **Nowak**. Could you tell me any other significant contributors to that pollution?

Mr. **Brick**. Well, certainly for other pollutants, for instance, for phosphorous, the lake has a eutrophication problem, the continued discharge of the sewage treatment plant to the lake, even though there is phosphorous reduction being achieved, still the remaining phosphorous load contributes to eutrophication of the lake. So that's a continuing source of pollution into the lake.

Mr. **Nowak**. Continuing to the degree that, as you clean up the lake with some technology, if it's significant, would it be significant in terms of relining the lake with another problem as you clean up the existing problem?

Mr. **Brick**. In particular, the phosphorous problem is also being addressed under the terms of that judicial order, and various options for control are being considered.

One option is to relocate the discharge below the outlet of Onondaga Lake to remove that. That's one of a few options that are being considered.

Mr. **Nowak**. But it will all be under this Management Conference, the work with the corps and the work with EPA and the work with the state people and the local input would all be funded for that analysis under this Management Conference agreement?

Mr. **Sidamon-Eristoff**. Yes and no. I mean, the Management Conference will represent the coordinating agency for all of these, but as programs develop and as work gets done and is funded, all of that will have to occur in accordance with the jurisdictions that are involved.

What we're hoping and intending to accomplish through this Management Conference is that the right hand and the left hand know what each other are doing, which has not always been the case.

Mr. **Nowak**. All right. We will, again, keep the record open, and we thank you for your attendance here.

[Mr. Sidamon-Eristoff's prepared statement appears on page 558.]

Mr. **Nowak**. Unfortunately, we have another vote, and I'll have to go to the House floor, but I'll be back in approximately 10 or 15 minutes, and we'll go right into the rest of the witnesses for today.

[Recess.]

Mr. **Nowak**. The subcommittee will come to order. We'll bring up our next set of witnesses, Mr. William Krichbaum, who is Regional Director, Region 7, New York Department of Environmental Conservation, and ask to join him Mr. Norman Spiegel, Assistant Attorney General, State of New York.

Mr. Spiegel.

TESTIMONY OF NORMAL SPIEGEL, ASSISTANT ATTORNEY GENERAL, STATE OF NEW YORK

Mr. **Spiegel**. Mr. Chairman and members of the subcommittee, my name is Norman Spiegel. I'm an Assistant Attorney General for the State of New York.

Thank you for the opportunity to appear on behalf of Robert Abrams, the Attorney General of the State of New York, to give testimony concerning the pollution and clean-up of Onondaga Lake.

Attorney General Abrams regrets the fact that he was unable to attend today, and he's asked me to convey his personal appreciation for the opportunity to testify in favor of this important legislation.

In offering the Attorney General's support for the Onondaga Lake Management Conference, I would like also to explain the state's efforts to force, through litigation, those responsible for the most serious pollution of Onondaga Lake to clean it up.

This would give the committee a more complete picture of our ongoing efforts to restore the lake as an environmental resource.

On June 27, 1989, the Attorney General, on behalf of the state, filed suit in the United States District Court in Syracuse, New York, against Allied Signal, Incorporated, as the most significant contributor of industrial waste to the lake.

The action seeks to compel the company to repair damage its pollution has caused and pay for losses to the state's natural resources.

Mr. NOWAK. I'm sorry. Mr. Spiegel, could you just move that mike up a little? I'm having a little trouble hearing your testimony.

Mr. SPIEGEL. Sure. Allied Signal's liability is predicated upon the Comprehensive Environmental Response Compensation and Liability Act, known as CERCLA, as amended by SARA, upon New York State's environmental conservation law and the state's common law of public nuisance.

In short, the purpose of the suit is to seek to regress for a century of indiscriminate dumping of industrial wastes. The complaint charges that starting in 1884 and continuing through 1986, Allied Signal and its corporate predecessors and interests engaged in the manufacture of chemicals at a huge industrial complex located near the southwestern shore of Onondaga Lake.

The complaint claims that Allied Signal disposed of the waste products of its chemical manufacturing operations by dumping, spilling and discharging such wastes into Onondaga Lake and its tributaries and onto land areas which drain into Onondaga Lake.

These wastes include mercury, chlorinated benzenes and alkali wastes, such as calcium carbonate, chloride and sodium. Today, the land areas where Allied Signal disposed of its wastes cover over 1,500 acres with the waste materials rising as high as 60 feet into the air.

A study conducted in 1989, two years after Allied ceased manufacturing activities at this facility, indicates that in excess of 400 tons of chloride a day continue to enter Onondaga Lake through the migration of ground water contaminated with Allied's wastes.

This amount represents only a fraction of the waste discharged to the lake daily over the 100 year period when Allied was engaged in active operations and waste disposal.

It is also estimated that from 1947 to 1979 Allied discharged approximately 165,000 pounds of mercury, a hazardous substance, into Onondaga Lake and its tributaries, contaminating the sediments of the lake.

In fact, the sediments of Onondaga Lake are so contaminated with mercury that the lake bottom has been placed on the state's registry of inactive hazardous waste disposal sites.

Allied also discharged large quantities of chlorinated benzenes to areas in close proximity to Onondaga Lake. A viscous swamp of tar highly contaminated with hazardous substances now covers a 22-acre area.

The staggering consequences of these waste disposal activities are enormous. The fish in Onondaga Lake are unfit for human consumption because they are contaminated with mercury, the lake bottom is covered by a layer of calcite, as much as four feet thick, which has severely damaged the littoral zone of the lake and otherwise damaged the lake's fishery.

Allied's disposal of waste into the lake has also contributed to conditions which make swimming unsafe. Due to the complexity of the lake ecosystem and the volume and variety of the chemicals disposed of in the lake, development of a comprehensive clean-up program will be no easy task.

In general, in any CERCLA litigation, the law requires the clean-up effort to comply with the procedures set forth in the National Contingency Plan.

The NCP, as it is known, and analogous state regulations require as a first step the preparation of a remedial investigation and feasibility study.

A remedial investigation is a comprehensive data gathering program to evaluate conditions of the site. The remedial investigation is intended to provide sufficient data to evaluate, select and design a remedial program.

The feasibility study evaluates the various treatment technologies and combinations of such technologies in terms of their ability to protect public health and the environment and attain appropriate clean-up levels.

The FS can include pilot studies and bench tests of various remedial alternatives to determine their effectiveness.

On average, an RI/FS takes two and one half years from the time the work is actually begun until completion. The study and remediation of Onondaga Lake will be a far more complex undertaking than the average inactive waste site, such as a landfill, and, consequently, we can anticipate a more time consuming process.

Once the RI/FS report is finalized, the state must select the most appropriate remedial program for the site. The decision making process provides for public comment, and when the matter is the subject of litigation, as it is in this case, for the review and approval of the court.

Once a remedial alternative is approved, the remedial program proceeds with the development of design specifications and actual construction.

In approaching the study and remediation of an inactive hazardous waste site, the State has available two basic options.

To the extent that monies are available, the state can contract with appropriate consultants, engineering and construction firms to perform the RI/FS and/or implement the selected remedy.

The State would then seek to recover through litigation the cost of such work from the responsible party. In the alternative, the state and the responsible party, in this case Allied Signal, can in the context of the litigation enter into consent orders whereby the work is performed by the company's consultants and engineers under strict State oversight.

As a result of the state's lawsuit, the state and Allied Signal are presently engaged in negotiations with respect to the possibility of Allied Signal funding the performance of the RI/FS.

It should be kept in mind, however, that Allied is not the only entity responsible for the contamination of the lake. In addition to our litigation against Allied Signal, on December 21, 1989, the State concluded an agreement with the LCP Chemical Company, which is now known as the Hammond Group, Inc., which settled a portion of that company's liability for contributing to contamination of Onondaga Lake.

As part of the agreement, LCP financed a conference of scientists and engineers with expertise in areas related to the Onondaga Lake ecosystem and its remediation.

The conference, which was organized by New York State, was held in Upstate New York in February 1990 and included a group of 34 scientists and engineers from around the world in addition to the state's technical experts.

The participants came from academia, government and private research and consulting firms, and from Sweden, France and Canada.

Their disciplines included chemistry, aquatic ecology, biology, geochemistry, engineering and mathematics. The participants met for three full days in five working groups, as well as in planning sessions, and addressed a host of issues related to the clean-up of Onondaga Lake.

We are very satisfied with the results of that conference, and we expect to have a proceedings document available in the near future.

We anticipate that the results of the conference will be extremely helpful in developing the RI/FS for Onondaga Lake. In 1988, New York State also reached a settlement with Onondaga County to pay for a $525,000 study of pollution of Onondaga Lake and to undertake extensive improvements in its sewage treatment facilities.

As evidence is developed, we may, of course, pursue other responsible parties to the extent that they still exist and are financially viable.

There remains, however, the likelihood that despite our best legal efforts, not all of the environmental problems associated with the lake will be amenable to the judicial process.

Nor is there any assurance that the judicial process will provide relief in a timely manner, particularly if the responsible party is uncooperative.

Consequently, we will need to look to other resources to complete the restoration of the lake. That is why the Management Conference and the funding provided by this legislation is so important.

We congratulate Senator Moynihan and Congressman Walsh for establishing the Onondaga Lake Management Conference and providing funds toward the study and remediation of the lake.

We are looking to the Management Conference to assist with the coordination necessary to ensure that various studies and remedial efforts undertaken by governmental and private entities are not duplicative and do not work at cross purposes.

The conference should also provide assistance by recommending various remedial approaches. Perhaps most important of all, funds made available by this legislation could be used to support environmental studies necessary to the ongoing effort to force those responsible for the contamination of the lake to clean it up and to address portions of the lake's environmental problems which are not resolved through the judicial process.

Onondaga Lake is the victim of over 100 years of environmental abuse. It will take the combined and coordinated efforts of the state, Federal, county and municipal governments to restore the lake as an environmental resource.

We thank you, Congressman Walsh and Senator Moynihan, for your leadership at the federal level, and I thank you, Congressman Nowak and the other members of the subcommittee, for this opportunity to present our views on this matter.

Mr. NOWAK. Thank you very much.

Mr. Krichbaum, Do you have a separate statement?

TESTIMONY OF WILLIAM KRICHBAUM, DIRECTOR OF REGION 7, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Mr. KRICHBAUM. Mr. Chairman, I'd like to summarize my statement, and if the entire statement could be entered in the record, it would be appreciated.

Mr. NOWAK. Without objection, so ordered.

Mr. KRICHBAUM. Good afternoon, my name is William Krichbaum, and I am the Region Director of the New York State Department of Environmental Conservation, Region 7, which includes Onondaga Lake.

I want to thank you, Mr. Chairman, for this opportunity. I also want to thank your colleague, James Walsh, who represents the Syracuse-Onondaga Lake district in this House.

Last fall, Congress appropriated $500,000 under the Clean Lakes Program for the Onondaga Lake Management Conference. DEC has applied for this grant money.

Commissioner Jorling has already testified in support of S. 2183, the 1991 water resources bill which contains authorization language for the conference.

Conference activities are already underway. Governor Cuomo, Commissioner Jorling, Congressman Walsh, Senator Moynihan, the Mayor of Syracuse, the Onondaga County Executive, and representatives of the State Attorney General, the United States Environmental Protection Agency, and the U.S. Army of Corps of Engineers attended the first meeting of the Onondaga Lake Management Conference on February 14, 1990.

I recently attended the second meeting of the Onondaga Lake Management Conference, so the conference is gearing up for its enormous task.

Onondaga Lake has become a symbol of environmental abuse. It has earned this dubious distinction as a result of a century of misuse by local industries and neglect by government.

Aside from the Lake's convenience as a receptacle for discharges of industrial and municipal waste, the lake's shallowness and its large watershed make it especially sensitive to pollution.

It receives urban and agricultural runoff from some 270 square miles. I want to briefly outline some of the actions which have been undertaken in the past and which are currently underway regarding the reclaiming of Onondaga Lake.

Several developments over the last two decades have resulted in measurable improvements in the quality of the lake. In the main, these improvements can be attributed to upgrading the Syracuse Metropolitan Treatment Plant, implementing federally required industrial controls through the State Pollution Discharge Elimination System, and Allied Chemicals closing of its nearby manufacturing facility in 1986.

Improved water quality has contributed to an explosion of interest in Onondaga Lake restoration within the last three years.

A major private redevelopment project on the lakefront has provided added interest for the clean-up. The potential for a billion dollar multi-use area with the lake as a focal point has silenced skeptics who thought that Onondaga Lake was a lost cause.

There is much excitement over the recreational, commercial, cultural and residential plans for the area. The optimism is based on the shared belief that we can clean up this lake.

Over the last several years, Onondaga Lake restoration has become a major environmental priority for the State of New York.

We have taken action to compel investigation and remediation of hazardous waste sites and other contamination in or near the lake and have pursued responsible parties in this effort.

The State has executed a national municipal policy settlement to upgrade the area's sewage facilities and to abate combined sewer overflows.

Though we have made headway, I must emphasize that much remains to be done. Swimming is not permitted because of poor transparency and high bacteria levels.

The fishery is impacted by chlorides, mercury contamination fish flesh, inadequate dissolved oxygen, high ammonia levels and a damaged habitat.

One of the most challenging problems exhibited by the lake is the condition of the lake bottom itself. The sediments are listed on a registry of inactive waste sites.

DEC has collected extensive sediment core data which will assist in formulating a remedial plan. The lake bottom is also coated with calcite.

This calcium carbonate deposition resulted from a combination of the lake's natural chemistry with calcium loadings from the Allied Chemical waste beds adjacent to the lake.

Closure of the Allied facility greatly reduced this input, but some leachate from the beds continues, and the historic damage provides a hostile environment for aquatic life.

The lower reaches of the lake are currently non-productive. The problems of Onondaga Lake are unique, and they are serious.

In some ways, the solutions will challenge the limits of existing technology. The lake can serve as a symbol of what Government can accomplish when it commits its resources to an environmental challenge.

I urge you to support the Onondaga Lake Management Conference, and I pledge the best efforts of our department to work with the federal and local governments and the private sector to restore Onondaga Lake.

Establishing and funding a Management Conference is the best way to marshal the financial and technical resources all parties can bring to this important effort. Thank you, Mr. Chairman.

Mr. **NOWAK**. Thank you very much. I have a couple of questions, if I may. The suit that was filed by the Attorney General, are there present negotiations to settle any portions of that suit?

Mr. Spiegel. Yes, there are. As I indicated, we are presently negotiating with Allied Signal with respect to the possibility of their performing an RI/FS, and we have met several times.

They are preparing a redraft of what's known as a Request for Proposal, which is a document going out to potential contractors to perform the RI/FS, and it describes the kind of work that we would be requiring of them.

Mr. Nowak. Is Allied Signal still operating any divisions on their former property or their property?

Mr. Spiegel. I believe that there is no active chemical processing going on on that site.

Is that right, Bill?

Mr. Krichbaum. That's correct.

Mr. Nowak. Let me turn to my colleague, Mr. Walsh.

Mr. Walsh. Thank you, Mr. Chairman.

I'd like to thank both of the gentlemen for their testimony and for their help through both their agencies, especially Mr. Abrams.

We're very grateful for the action that he's brought against Allied Chemical. Just a question. The Chairman asked a good question about the lawsuit, and the other question that I would like to ask is in the resolution of that action, is it possible, just in the realm of possibility, that Allied Chemical would be forced to abate any or all of the, even though they're no longer operating, as you pointed out, the leachate is still entering the lake, there's a benzene plume that's at the southwest corner of the lake, would they be possibly forced to abate all those continuing point pollution problems?

Mr. Spiegel. Absolutely. That's the very purpose of the lawsuit. The fact that they're no longer operating on the site, from a legal perspective isn't particularly relevant.

They created these problems, and they are legally liable for them, subject, of course, to the rules of evidence.

Mr. Walsh. Would that include all the waste beds, even the ones farthest from the lake?

Mr. Spiegel. Yes. The lawsuit addresses the impacts on the lake from all of these sources. The waste beds, they're all located, as a matter of fact, in the recharge basin of Onondaga Lake, and all of the waste beds and tar beds, the contaminated ground water that is entering the lake, as well as the contaminants that are presently in the lake, are covered.

Mr. Walsh. How about the mining activity where Onondaga Creek rises which feeds the lake? Are they also included?

Mr. Spiegel. No, they're not. The solution mining activities, I believe you're referring to, in Tulley Valley?

Mr. Walsh. Yes.

Mr. Spiegel. They are not a subject of this lawsuit.

Mr. Walsh. Okay. I'd like to ask Mr. Krichbaum, the Chairman asked earlier about the degree of pollution still entering the lake, and based on your knowledge, sir, where would you say, other than the Allied Chemical waste beds and benzene and those activities, where would you say the pollution is coming from now?

Mr. Krichbaum. Combined sewer overflows through the city of Syracuse Metropolitan Sewage Treatment Plant.

Mr. **Walsh**. What percent of the pollution would you say that's entering the lake comes from those two sources?

Mr. **Krichbaum**. As far as the sewage that's entering the lake, probably 100 percent of it. The county has two pump stations, Lake Creek pump station and the Liverpool pump station.

Grant money has come through for them, and they are in the process now of upgrading the two pump stations, so that will eliminate raw sewage from the two sources, but the combined sewer overflow still adds to it on a regular basis whenever you have heavy rains.

Mr. **Walsh**. Are there any other industrial polluters still on the lake?

Mr. **Krichbaum**. LCP was there up until about a year and a half ago, and we had problems with them. There was a break in one of their discharge lines in the wintertime, and they need emergency approval to dispose of their waste, which we granted to them, but we took a sample of it, and we found that they're in violation of their permits.

Three-quarters of a pound of mercury was entering the lake on a daily basis, and they were shut down. So I think pretty well we have identified all of the sources coming hopefully.

Mr. **Walsh**. Then the point of this discussion we're having is clear, that the pollution now that's entering the lake is primarily from Onondaga County's combined sewer overflow system, which is based primarily in the city. Is that correct?

Mr. **Spiegel**. But through that same system, through that same Onondaga Creek, you've got non-point source pollution that could be coming from agricultural farms further out and other sources further out through the river system. So that has to be looked at also.

Mr. **Walsh**. In the effluent coming in through Metro and through Onondaga Creek, the overflow, is there any heavy metals entering the lake?

Mr. **Krichbaum**. Not to my knowledge.

Mr. **Walsh**. Okay. Just one last point. Mr. Spiegel pointed out the RI/FS process that Allied may be involved with, the LCP conference, the resolution of the Onondaga County suit, mentions, it would seem, some very, very good opportunities to gather data.

Will it then be the responsibility of the Management Conference to gather all of that data? That's my understanding. Is that your understanding, too?

Mr. **Krichbaum**. Well, what we are doing in the region, administratively the region is handling the waste beds themselves.

We have a consent order in place with Allied, they finished the first phase of that, and now they're working on the draft feasibility study on what's the best way to close the beds to stop the chlorides from leaching through.

The first draft of that will be in our office the middle of April. We'll review that, and certainly we are a member of and we will be working very closely with the Management Conference.

There's a lot of expertise there that certainly can help us out.

Mr. **Walsh**. Thank you both very much.

Mr. Chairman, I don't have any other questions of these men.

Mr. **Nowak**. Well, thank you for your appearance and your testimony here. We will look at this and perhaps invite you to just stay, because both of you, I'm sure, would like to hear from the next group of witnesses who are playing a part in this whole program.

I think every step of the way and every move that you make they're going to be looking at the results of and certainly the impacts of any negotiation.

These lawsuits tend to go on for some time if they're fully contested. I wonder if you can give us any indication, Mr. Spiegel, of what the present anticipation is of the Attorney General in this matter, and my other question was how many other defendants do you have in the superfund lawsuit?

Mr. **Spiegel**. The only Defendant in the superfund lawsuit is Allied Signal. LCP would have been a defendant as well had it not contacted us and indicated its willingness to take up its environmental responsibilities, and in a step process, it has taken that first step.

But right now, the only Defendant in the superfund lawsuit is the Allied Signal Corporation.

Mr. **Nowak**. Are there other or different possible Defendants being reviewed by the department?

Mr. **Spiegel**. In the phase two study, there were contaminants found in the lake that, at this point, we really can't attribute to anyone.

As evidence is developed and other responsible parties come into focus, we will certainly look very closely at including them in this lawsuit.

Mr. **Nowak**. Okay. Thank you very much.

Thank you, Mr. Krichbaum.

[Mr. Spiegel's prepared statement appears on page 565.]

[Mr. Krichbaum's prepared statement appears on page 494.]

Mr. **Nowak**. Let me now call as a panel, if I may, the four interested groups that have had a substantial interest, I would assume, in reviewing all of the government's actions on all levels, Christopher L. Spire, of the Syracuse Partnership for Onondaga Lake, if he will come forward; Mr. Robert D. Hennigan, who is Chairman of the Onondaga Lake Advisory Committee; along with Steven W. Effler, who is the Upstate Fresh Water Institute, Inc., representative; Julia Portmore, who is the Sierra Club Representative of Onondaga County; and Donald Forman, who is the Director of Clean Water Programs, Atlantic States Legal Foundation, Inc.

Ladies and gentlemen, welcome. Mr. Walsh said that there's a 5:00 flight that may affect somebody's schedule, and he thought maybe they should be given the honor of testifying first here.

Do we have any indication of who would like to go first or second? Yes, sir.

Mr. **Effler**. I appreciate that, Mr. Chairman.

Mr. **Nowak**. Go right ahead.

TESTIMONY OF STEVEN W. EFFLER, UPSTATE FRESH WATER INSTITUTE, INC.

Mr. **Effler**. I wish to be entered into the record my written testimony for this hearing. I hope you have it in front of you now.

Mr. Nowak. We do. Without objection, so ordered.

Mr. Effler. Very briefly, my background. I am a Research Engineer and a Scientist, and I serve on the Board of Directors of the Upstate Fresh Water Institute.

It's a not-for-profit research corporation, and I've been involved in the scientific and engineering study of Onondaga Lake since the mid-1970s.

Since 1987, these efforts have been funded by a combination of local, state and some federal funding. During this interval of studies, we've worked hard to establish the credibility of our findings through publication and peer reviewed professional journals.

The study of Onondaga Lake has not always been in vogue. You'll find attached a list of some of these publications that have appeared in professional journals.

They number more than 35. I've always felt it important to maintain somewhat of a more global perspective. Early on in the study of Onondaga Lake, it became clear that this was not your typical lake.

We worked hard to keep a broader perspective by being active in the research of other lakes, we've published more than 35 journal articles concerning other lakes, most of which are located also in the Central New York area.

Further, I have served as reviewer for five different international environmental journals. So how bad is Onondaga Lake?

I think you've heard some qualitative statements about it, and I guess I can only add more to that. It has been described as the most polluted lake in the United States.

I am unaware of another lake in the United States or elsewhere that suffers from the myriad of problems that are manifested in this lake, and I think that I can say that with some authority, since I see coming across my desk routinely articles to review from other lakes that claim they have problems.

As it's been indicated, the lake is presently closed to swimming, and fish from the lake cannot be eaten. On Table 1, I have summarized for you some of the routinely violated water quality criteria that prevail in Onondaga Lake.

I've indicated in the lefthand column the resource affected, the two I've indicated so far are swimming and the fishery, and I've indicated the various parameters that presently don't meet existing regulatory criteria.

This is not just once in a while; this is routinely. With regards to swimming, the lake has poor clarity, and quite often, particularly after rainfall events, we have high concentrations of fecal bacteria.

The fishery is impacted widely. First, the fish flesh is contaminated, and that represents a public health potential problem.

Low oxygen concentrations prevail throughout the lake during fall, this is a fish habitat problem, and the lake routinely fails to meet criteria to protect against toxicity against fish with regard to ammonia and nitrite.

This is not the full story. On Table 2, which is on the following page, I have given a more extended listing of water quality problems that prevail in the lake that don't necessarily fit into criteria.

As you can see, the list is rather long. I don't want to differ with previous presenters, but to present the situation as knowing everything that there is to know about the problems of Onondaga Lake presently and thus we can go forward is simply not correct.

We are learning every day about more problems that this lake has. However, there are reasons for optimism. First, as indicated and as we've documented in the professional literature, there have been positive responses of the lake to recent reductions in the inputs of various pollutants.

Yet, further reductions obviously will be necessary to meet the criteria. Further, engineering and scientific studies have recently been initiated that promise to provide reliable management tools in the form of mathematical computer models which will guide remediation of several of the lake's problems.

Simply put, these models represent an objective basis to evaluate first the feasibility of reclaiming various water quality characteristics, and, secondly, what level of reduction of the various inputs will be necessary to achieve specific water quality goals.

Presently, this system offers challenges and opportunity. The restoration of Onondaga Lake represents a major technical challenge that will require first a complete scientific and engineering understanding of the lake.

The manifestation, the outcome of this, will be credible mathematical models. Now, when I say credible, that means we've demonstrated that they work, that they should be believed, that we should trust the projections and be willing to make management decisions based on them.

I might remind the Chairman that water quality modeling played an important role in establishing effluent criteria for the Great Lakes Basin, and in particular the reclamation of Lake Ontario, and a lot of that modeling was done down at Manhattan College.

Secondly, above and beyond the development of these credible models, we'll need innovative engineering approaches and designs to actually implement remediation.

It's important to remember that the individual problems of Onondaga Lake and its tributaries are not unique to the lake, though perhaps no other systems suffer from so many problems.

Thus, the understanding and solutions obtained here on this lake are going to be transferable to other systems. Other systems have nitrogen problems, ammonia problems, nitrite problems, mercury problems, oxygen problems.

The problem of Onondaga Lake is how many of the problems that it has. Thus, any of the solution scientific engineering remediation that we come up with on this lake should have value in remediating lakes with similar problems.

Onondaga Lake represents the ultimate challenge in remediation. I've been interested in the emphasis in presentations and the comments of the chairman with regards to lake sediments and the problems that represents.

In fact, the technology, the scientific paradigms now exist, to support the development of mathematical models for sediments themselves.

One of the worst things I can imagine would be spending a lot of money on the remediation of Onondaga Lake sediments dredging, the cost involved, the potential negative side effects, to find out in the end that if we understood the release of pollutants from the sediments, we'd find out we may not have to do anything with them at all, except eliminate the continuing inputs.

Thank you for this opportunity, Chairman.

Mr. **Nowak**. Thank you very much.

Mr. **Nowak**. Who would like to be the next witness? Go right ahead, sir.

TESTIMONY OF CHRISTOPHER L. SPIRE, SYRACUSE PARTNERSHIP COMMITTEE ON ONONDAGA LAKE

Mr. **Spire**. Chairman Nowak, Congressman Walsh, I am Christopher L. Spire, a member of the Syracuse Partnership Committee on Onondaga Lake and Plant Manager of the Anheuser-Busch facility in Baldwinsville, New York.

William J. Donlon, Chairman of the Syracuse Partnership Committee, regrets that he is unable to attend and asked that I represent him at this hearing.

The Syracuse Partnership consists of the Onondaga County Executive, the Mayor of the city of Syracuse, the Chancellor of Syracuse University, and the four top officers of the Metropolitan Development Association, representing the business leadership of the Central New York community.

The purpose of the Partnership is to identify and agree on key community projects and issues which will benefit from concerted attention of this group.

The business community has joined with city and county government to bring together the total resources of both the public and private sectors in addressing and solving major problems or capitalizing on major opportunities for Central New York.

The Syracuse Partnership has selected as its highest priority the clean-up and restoration of Onondaga Lake. As MDA Directors, Bill Donlon and I lead a committee of the Syracuse Partnership comprised of major community leaders and representatives from the Onondaga Lake Advisory Committee.

The Syracuse Partnership Committee has accepted the responsibility and is prepared to do whatever it takes to assist in any and all aspects of restoring and properly maintaining Onondaga Lake.

The mission and purpose of the Syracuse Partnership Committee is as follows. One, working in concert with the recently appointed Onondaga Lake Management Conference, the committee will bring together and focus the efforts of many groups, organizations and agencies that have an interest in restoring Onondaga Lake.

Two, the committee will recommend and take whatever action is necessary to secure required State and local matching funds to be coupled with the considerable investments, both public and private, already made to match the federal assistance provided for in the pending legislation.

The committee will cause preparation of a community land use master plan for the land surrounding Onondaga Lake. This utilization plan will ultimately be supported by the appropriate enabling and enforcing legislation and adopted as the community's master plan for Onondaga Lake and adjacent areas.

To date, some degree of progress has been made on each of these objectives. Committee members have met with local government officials, state environmental representatives, Colonel Boyd and his staff, the U.S. Army Corps of Engineers, as well as local interest groups and organizations.

The committee anticipates meeting with local state legislative delegation in the near future to begin discussions relative to the required State/local match provision in the federal legislation.

As both County Executive Pirro and Mayor Young have indicated, federal participation in this effort is critically important if we are to be truly successful.

Without federal funding assistance, the community will be unable to address the major pollution problems facing the lake. Although federal participation is critical, we recognize as a committee and as a community that we cannot expect the Federal Government to be solely responsible for turning our plans to action.

As I have noted above, we are prepared to put into place whatever state and local participation, either public or private, that is needed to match the aggressive support you are coordinating on our behalf.

I believe one of the most important messages I could bring to you this morning is that the entire community is behind this effort.

Organizations which at times have opposing views are joining forces on this Onondaga Lake project. We have a unique and perhaps one time opportunity to do something about the lake.

It is an opportunity we must not waste. We also clearly understand that the process for receiving federal assistance will take considerable effort, but we are encouraged by steps that have already been taken, most notably the appointment of the Onondaga Lake Management Conference and appropriation of funds by Congress for both the Management Conference and the Corps of Engineers.

We are convinced that the aggressive program proposed in the legislation will ultimately transform Onondaga Lake from a liability, and, quite frankly, a community embarrassment, into an internationally recognized success story.

As has already been eloquently stated by previous speakers, this project is important from both an economic and environmental standpoint.

Simply stated, this is the single most important project that will lead our community into the next century. From an environmental perspective, we have learned that benefits from this project will transcend the immediate boundaries of Onondaga Lake.

Since water in the lake flows north, remediation of pollution in Onondaga Lake will benefit the three river systems and ultimately Lake Ontario, an international body of water.

Therefore, far from being a local or parochial issue, expenditure of federal funds for Onondaga Lake as called for in the legislation will have far reaching national and international benefits.

From an economic standpoint, Onondaga Lake represents a community resource of untapped potential. With construction already underway on a major regional shopping center at the southern end of the lake and with plans for housing, offices and an inner harbor, the economic development potential can already be demonstrated.

The combination of clean water and a community master plan for the lake will ensure that Onondaga Lake becomes the focal point of the entire Central New York region.

I should also note the expenditure of public dollars for the restoration of Onondaga Lake will have substantial in kind benefits which will impact all properties in proximity to the lake.

The spinoff effect from the upgrading of these lands will be of major community-wide importance. To conclude, it is the goal and objective of the Syracuse Partnership, with your help, to restore Onondaga Lake to a condition where it is viewed as a community asset rather than a liability.

The reasons for moving now are clear and compelling. The community is unified and organized. The public and private sectors are prepared to do what is necessary.

Already, local governments and private industry have invested an estimated $300 million to correct problems that have caused pollution.

The Onondaga Lake Management Conference has been established and will ultimately require significant resources to carry out their recommendations.

We have an opportunity to demonstrate that the various levels of government and the private sector can, in fact, work as partners and accomplish something significant, something that can serve as a model for other communities across the country.

The Syracuse Partnership stands ready to work with you. We thank you for your efforts and offer our assistance in this most worthwhile cause.

Thank you very much for the opportunity to appear before you today.

Mr. **Nowak**. Thank you for your testimony.

Mr. **Nowak**. Let us turn now to Mr. Robert D. Hennigan of the Onondaga Lake Advisory Committee.

TESTIMONY OF ROBERT D. HENNIGAN, CHAIRMAN, ONONDAGA LAKE ADVISORY COMMITTEE

Mr. **Hennigan**. Good afternoon, Mr. Chairman, and thank you for this opportunity. I would note that a few years back I was President of the New York Water Pollution Control Association and currently am Executive Secretary, and we recognized the service of the Chairman by giving him the most honor we could bestow on anybody by giving him an award at our New York meeting, and I hope you remember that occasion. An award richly deserved, by the way.

You've heard so much testimony today that I'd like to pay tribute to your patience. There is just an awful lot of redundancy in much of this material.

I come here, I am Chairman and Professor of the Faculty of Environmental Studies of the State University of New York College of Environmental Science and Forestry at Syracuse.

I am also the Chair of the Onondaga Lake Advisory Committee. I was formerly Director of the Onondaga Lake Management Project, which was mentioned by EPA, under 208.

I come here representing this committee, and this committee is a broadly representative group with members from the business community, the environmental community, local residents and local, city, county and State governments.

The mission of the committee is to advise and make recommendations to State and local governments on programs and policies affecting the lake quality and usage.

We've been in operation since 1986, carrying out educational and advisory functions and activities. We're here as an advocacy for the lake.

We're an advocate, rather, for the lake; we carry no other agenda with us. We're not trying to justify anything or anything of that nature.

That's our only purpose. We're here as an advocate of Onondaga Lake. Up until about 1900, the lake, as you've heard, was a major recreational asset and was used for all kinds of purposes.

Over the next 70 or 80 years, the lake turned into little more than a disposal point for sewage and industrial waste and has reached its nadir in the early 1950s.

I'd hate to describe it to you, but you can read about it in the text. The fishery was destroyed, surface activity was nilled, bathing was prohibited, fish flesh was contaminated, chloride input was tremendous, fishing was prohibited, extensive portions of the shoreline were used as waste depositories and waste beds by the Solvay Process Company.

It was paradise lost, and we're now addressing the question of whether or not paradise will be regained, and the action now contemplated will help us meet the goals of the Clean Water Act of fishable and swimmable waters.

The restoration of this lake has been a long time goal of the community. Believe it or not, it was in the 1920s when this community first created committees to raise the issue and the question of restoring Onondaga Lake.

In the 1920s. Isn't that incredible? Here we are 60 some odd years later. There have been a lot of obstacles to this, obviously.

Limited resources, poor technology, lack of effective programs and policies at National and State levels. However, with the advent of the Clean Water Act and a heightened environmental sensitivity, people started to get interested again in seeing what they could do with this lake.

Then we did a whole lot of things which are all enumerated here, and in addition to this, we entered into as a community endeavor major redevelopment activities around the lake shore.

All of this has triggered a lot of interest in what we can do and what the potentialities are for the restoration of Onondaga Lake.

However, we still have the distinction of having one of the most polluted lakes in the country, maybe in the world, in the middle of our community.

I would note parenthetically that if the work done today was sufficient, or if this restoration was an easy task, it would have already been done, and we wouldn't be here talking about it.

So notwithstanding all the action that's been taken by all these different agencies, we still have a major restoration and remediation problem that's facing us.

It seems to me it boils down into four main issues. One, providing for a comprehensive management organization; developing short range and long range plans; funding and completing needed plans and studies; financing and constructing remedial projects; and ensuring that continued monitoring and management activities take place.

The action proposed today through this Onondaga Lake activity, the Restoration Act, provides the elements needed to carry this project to a successful conclusion.

It provides for the Management Conference or the oversight needed, and it provides funding mechanisms to carry out needed work.

Furthermore, the lake is part of the nation's waters, it comes under all kinds of jurisdictions of federal acts and federal activity, and they've been recited here, including the Corps of Engineers, the International Joint Commission, the Great Lakes Compact, they're navigable waters; in other words, there's a major federal interest here.

This is truly a joint cooperative resource issue requiring the combined commitment of private and public interests and of local, State and Federal governments.

It's another case which tests the effectiveness of our National Federal system, and I would reiterate if it was an easy job, it would already be done, and we wouldn't be here.

The restoration of Onondaga Lake will demonstrate our National commitment to effective and responsible environmental management.

I would note as an aside, there's an Appendix A to this statement, which lists any number of actions that are actually necessary to move on the Onondaga Lake situation.

Furthermore, the bill now under consideration here by this House recognizes the nature of this situation. We recognize and compliment Congressman Walsh and the Chairman, Congressman Nowak, Senator Moynihan, and Senator D'Amato in developing and advancing this significant piece of legislation.

For the first time, we've had really significant political capital laid on the table in support of Onondaga Lake.

We strongly support the legislation, urge the House to act favorably and in a timely manner, and this could be an example to the nation and to the world of how this democracy confronts and solves environmental issues and problems.

Furthermore, I sent a magazine up to the Chair, and if he's interested in the history of Onondaga Lake, he can read about it in a couple of articles that are in this issue of Clear Waters.

In closing, I'd like to thank you for this opportunity to be heard, and I really have tremendous hope that this thing will go through to completion, and we will, in a reasonable length of time, recover Onondaga Lake for the people of Onondaga County and the Nation. Thank you very much.

Mr. **Nowak**. Thank you very much.

We've heard from Steven, now we go to Julia Portmore, the Sierra Club Representative, Onondaga County.

TESTIMONY OF JULIA PORTMORE, REPRESENTING THE SIERRA CLUB, ATLANTIC CHAPTER

Ms. **Portmore**. Thank you. My name is Julia Portmore, I am a chemist by training, and I represent the Sierra Club on the Onondaga Lake Advisory Committee, where I Chair the Environmental Subcommittee.

I also represent the Sierra Club on the Citizens Committee for the Oswego Harbor Remedial Action Plan. I would like my full testimony entered into the record, if that's possible.

Mr. **Nowak**. Without objection, so ordered.

Ms. **Portmore**. I have done a very brief summary. In keeping with the tradition of blessing its nearby waters, the congregation of the Russian Orthodox Church in Syracuse prays for Onondaga Lake.

Indeed, until the Onondaga Lake Restoration Act was introduced, it did appear that divine intervention would be the lake's only means of salvation.

From its past glory as a grand resort, Onondaga Lake, as has been said before, has become one of the most polluted bodies of water in the world.

In the 1800's, the lake was a prime tourist attraction, as well as the center of a thriving whitefish industry. At about the same time, Allied Chemical Company began producing soda ash at its plant on the lake's west shore, beginning the process that led to the lake's demise.

The waste from this operation, which was dumped into Onondaga Lake, included 20 pounds of mercury per day for 18 years.

An extensive coring of Onondaga Lake sediments by the New York State Department of Environmental Conservation has found concentrations as high as 85.37 micrograms per gram, or parts per million.

The background range for New York soils is .02 to .05 micrograms, and this information comes from the New York State Department of Environmental Conservation 1989 Draft Engineering Investigation at Inactive Hazardous Waste Sites.

Yet, despite Allied's role in the lake's decline, there is plenty of blame to go around, for virtually everyone in the area polluted Onondaga Lake.

Meanwhile, both the resorts and the whitefish have gone. We must remember, however, that Onondaga Lake is not a body of water unto itself.

It is part of the Oswego River Basin, which also includes the well-known Finger Lakes. All eventually flow into the Oswego River, which flows directly into Lake Ontario.

The sediments of Oswego Harbor, as the river enters the Great Lakes, are also contaminated with mercury. To understand the implications of this finding, we must look at the Great Lakes Water Quality Agreement.

The International Joint Commission, called the IJC, was established in 1909 as part of the Boundary Waters Treaty between the United States and Canada.

Through this bi-national organization, the two governments signed the Great Lakes Water Quality Agreement in 1972, which was revised and expanded in 1978.

The later version included provisions for the control of toxic substances and to protect the water quality and health of the entire lake system.

Yet, despite considerable progress in clean-up over the past decade, serious problems remain. The IJC has listed 42 toxic hot spots, called areas of concern, in the Great Lakes Basin, and one of these is Oswego Harbor.

The New York State DEC has found the levels of copper, lead, zinc and mercury exceed water quality standards or guidance values in Oswego Harbor, and these metals are found in fish tissues in high levels as well.

Stage one of the remedial action plan for Oswego Harbor, being prepared by the DEC and its Citizens Advisory Committee, states, and I quote here, "mercury, mirex and dioxin have been identified as substances that are causing impairments in Lake Ontario and that may be transported throughout the area of concern (which is the Harbor) and into Lake Ontario in significant amounts. The largest source of mercury is the bottom sediments of Onondaga Lake."

In signing the Great Lakes Water Quality Agreement, Canada and the United States have committed themselves to the goals of virtual elimination of all persistent toxic substances to the Great Lakes.

To reach this goal, it is imperative that the 42 contaminated areas of concern, including the Oswego Harbor, be remediated, and in order to remediate Oswego Harbor, it is obviously necessary to remediate Onondaga Lake.

The flow of mercury and other toxic materials from Onondaga Lake into Lake Ontario must be stopped. We see this as a local problem, a state problem, and a Federal problem, and we urge the cooperation of all parties in its clean-up.

We thank you for providing the opportunity for us to speak before you today.

Mr. **Nowak**. Your welcome.

Let me turn to Donald Forman now, who will be the last witness, I believe, the Director of the Clean Water Programs of the Atlantic States Legal Foundation, Inc.

Mr. Forman.

TESTIMONY OF DONALD FORMAN, DIRECTOR OF CLEAN WATER PROGRAMS, ATLANTIC STATES LEGAL FOUNDATION, INC.

Mr. **Forman**. Thank you, Representative Nowak, and thank you, Representative Walsh, for triggering this process. I'm not going to be redundant in thanking you further or in repeating the litany of past horrors and present hopes that you've heard from almost everybody today. But I'll summarize some of the parts of our written testimony which are a little bit different, and you can put that complete testimony into the record, along with the attachments that accompany it. We have some specific concerns, some changes and clarifications, that we would like to see added to the proposed legislation so that our federal money can be more effective in actually producing a clean-up of the lake.

Three of these concerns have to do with the types of projects which will be funded.

There have been various mentions today of the consent decree among Onondaga County, Atlantic States, and the State Department of Environmental Conservation, and we're pleased that that consent decree is in place and that the county is cleaning up its discharge. But one of our concerns is that the money from this bill not be used simply to subsidize the actions which the county is required to do under that consent decree, which it's required to do in any case. This money should be used to supplement those efforts—to make changes that will go beyond existing programs in improving Onondaga Lake.

Similarly we'd like to see the bill specify in general that the funding is designed to do things which wouldn't be done otherwise. For example, where the State has brought natural resources damage claims, or may do so in the future, we would not want to see Federal action that would duplicate or preclude the improvements which the State would bring through those actions. We want to see this funding bring about more improvements, more changes in the lake, than could be done otherwise.

Finally, with regard to project types, there should be a clear emphasis in the Act on feasible projects that will do the job at an appropriate cost. We'd like to see Onondaga Lake cleaned up, but we also want to see other lakes throughout the country cleaned up, so we want to see money used on projects that will be successful. Risks should be limited to genuinely well thought out attempts to develop new technologies.

Then we have three concerns which are slightly varied in nature. One has to do with the representation on the Management Conference. We would like to see one voting member, one full member of the conference, to be a representative of the environmental community. Environmental organizations have been carrying the ball for Onondaga Lake for more years, more decades, than I've been around. They've played a key role in bringing this to public attention so that today it could become an issue of much broader concern. The constituencies with this history of interest and expertise should have a voting role on the Management Conference.

Another issue has to do with shoreline access. Hopefully, we're going to be spending $100 million of public money to improve the lake. As a result, the shoreline is going to become an attractive place, we hope, and people are going to want to go there.

It's important to make sure that the public has access so that we, the public, derive the benefit from this expenditure of our public money.

Our final point is somewhat technical. Your bill is very good in that it allows applications for funding from a wide diversity of applicants, and it quite reasonably requires matching funds from the applicants. But one important point, which should be specified, is that those matching contributions can be done in kind, not just in cash. This is very important for the non-profit community which, as President Bush has pointed out, harnesses a lot of energy, a lot of abilities that you couldn't get for money alone or that would cost many, many tens of thousands, millions of dollars to harness.

All six of these changes are completely within the spirit of the bill, because your aim and our aim totally coincide: We want to see an Onondaga Lake that's cleaned up and that will be a real asset to the community and the Nation.

Thanks for the opportunity to be here.

Mr. NOWAK. Thank you very much. Let me just pick up on your second to last point. You mentioned environmental membership on the Management Conference.

Are any of our witnesses presently on that conference or are you in a sub-conference? How are you playing a role in the so-called management conference? How is that constituted?

Mr. HENNIGAN. Well, the Management Conference has two subcommittees, one is the Citizens Advisory Committee and the other one is the Technical Subcommittee.

They're now in the process of formulating those two subcommittees.

Mr. NOWAK. On those subcommittees there is not one environmental position?

Mr. HENNIGAN. There is on the subcommittees. There is on the Citizens Subcommittee, but that subcommittee, you know, the person does not sit as a member of the Management Conference.

Mr. FORMAN. There's no voting representation from the subcommittees to the main committee.

Mr. NOWAK. They're advisory only?

Mr. HENNIGAN. Advisory only.

Mr. NOWAK. So unless you have a member on the Management Conference, you're not going to have a voice if the advice you submit through the sub gets into the conference and is not adopted.

Mr. FORMAN. It will be a much weaker voice.

Mr. WALSH. Mr. Chairman?

Mr. NOWAK. Yes, Mr. Walsh?

Mr. WALSH. If the gentleman would yield, I believe the make-up of the conference was formed as an intergovernmental approach to administration of the funds at the direction of the subcommittees, and I believe that's the way it was formulated.

Mr. NOWAK. Ms. Portmore, didn't you mention that you were a member of the subcommittee as a Sierra Representative?

Ms. PORTMORE. Yes, I'm a member of the Onondaga Lake Citizens Advisory Committee, which was established by DEC in 1986.

I believe our subcommittee is the group in the community that really gave a push to this clean-up effort. Members of this Citizens Advisory Committee will be chosen to serve on the Management Conference's Citizens Subcommittee, but we will not have a vote.

Mr. NOWAK. Would you join in that request for a vote?

Ms. PORTMORE. Yes, I certainly would.

Mr. NOWAK. How about the rest of you at the table?

Mr. HENNIGAN. Well, if we go back to what Representative Walsh said, it depends on the nature and purpose, I think, of the Management Conference.

I don't object to anybody sitting on the Management Conference, as a matter of fact, but it is now composed of governmental officials, I mean exclusively.

As I understand it, the Technical Subcommittee should have a major role in making recommendations. How the Citizens Subcommittee would work I really haven't got any idea.

I don't know. I think that's a question that needs to be debated, as a matter of fact.

Mr. **Nowak**. All right. Let me move from that. You've raised a number of issues, I think, that we'll be looking at, but at least we've got your basic support for a program to start to focus not only some of the federal dollars, but I think more importantly, in this case, it's going to be the focus on technology onto what exists there before anything is going to be done about it, and before you do that, you're going to have to look at the various programs, both Federal and state, and try to eliminate any sources of pollution that are still existing.

We talked about the non-point sources, we talked about the others, and it seems to me that it's going to be an awful lot of work, and while the lawsuits are pending, some of that can have substantial impact.

We looked at the reduction of phosphates in the Great Lakes. You know, many said in 1970 that Lake Erie was dead. I guess Life Magazine or Time or somebody had the picture on the cover and said it's too bad but it will never come back.

Yet, our lake is the shallowest of the Great Lakes, and the flushing action was tremendous. But, of course, you have a different environment.

Now we have the zebra mussel to contend with, so it's a never-ending process, and we hope that we can aid you as we go along.

I'll certainly be working with Mr. Walsh, and let me, at this point in time, see if he has any further questions for this panel.

Mr. **Walsh**. Thank you very much, Mr. Chairman.

I'd like to thank the panel for their expert testimony and for breaking a little new ground in the testimony and giving us some opportunity for thought and perhaps some constructive changes as we develop this program.

A question of Mr. Forman. You suggested that the money not be used to help Onondaga County abate its waste water treatment problem.

I believe that's the way I understood it. While the Department of Environmental Conservation and the gentleman from EPA pointed out that perhaps all of the pollution, other than the toxic waste sites that need to be abated on the Allied Chemical site, all the pollution now entering the lake comes from the combined sewer overflow and the Metropolitan Sewage Treatment Plant.

What would you suggest would be a proper expenditure of any federal dollars that would be brought to bear?

Mr. **Forman**. A lot of the problems come not from present day point source pollution, but from the pollution which is already in the lake in the sediments, and from non-point source pollution which is still coming in today.

So based on the level of technical understanding that I have at this time, it sounds like there are a lot of further projects that need doing.

I'll defer to others who know more on this and to information we develop over the years, but my sense is that the reason this is before us today is that it's not something that can simply be resolved by stopping the ongoing pollution. That's why it's such a complex issue to deal with.

Mr. **Walsh**. There has been an approach to waste water treatment that the Federal Government has had with local governments over many, many years.

I'm sure Mr. Hennigan knows far more about this than I, but for years and years, there was a federal program where the Federal Government provided 75 percent of the money and the state provided 18 percent and the local municipality provided 7 percent, and that sort of coalition effect really brought a lot of resources to bear on waste water treatment.

I think we really do have a waste water treatment problem here. Granted, we have other major toxic problems that have to be dealt with, and hopefully Allied Chemical will handle some of those.

The points you made about the shoreline being available to the public, I think that's essential since we are spending taxpayers' money that that shoreline should be such, and I don't know if it's been noted in the record yet, but it should be noted that 95 percent, and soon to be 100 percent, of the lake shoreline is publicly owned and would be accessible to the public.

I think that's really key to this, because if we're expending taxpayers' dollars, that is a truly public lake, perhaps one of the very, very few in the country.

As regards Ms. Portmore's comments, I enjoyed them regarding the Russian Orthodox Church. That church is in my old neighborhood of Tipperary Hill, a very interesting neighborhood.

A predominantly Irish neighborhood with a Russian and Ukrainian Orthodox Church on it, and that church looks right down on Onondaga Lake, and hopefully the prayers will be answered by that highly diverse ethnic neighborhood, and we'll all benefit.

Just one question. That is, the Sierra Club is a national organization. I just want to get kind of a feel for how this project would rank on a national priority, we've talked about priorities, on a national priority list for the Sierra Club, if they do things that way.

Ms. **Portmore**. Yes, they do prioritize national issues, and I see Onondaga Lake as part of the Great Lakes problem. I don't see it as an isolated, parochial problem in the city of Syracuse.

It is contaminating Lake Ontario, and if the United States is going to fulfill its commitment with Canada to end toxic discharges into the Great Lakes, then, by God, we've got to clean up Onondaga Lake.

Mr. **Walsh**. That's exactly the point, I think, one of the very important issues of this hearing, that a national organization with the credibility of the Sierra Club bringing its very, very important point of view to an issue that is not parochial in any sense.

It is part of the Great Lakes watershed, it's national, and it's an international issue, and we very much appreciate the involvement that Sierra Club has brought to this.

I'd like to thank Mr. Spire for his testimony, because we have a very progressive, I think, partnership organization between business, government, and the environmental community in Central New York, and that's going to be key to the solution.

To Mr. Hennigan, I don't want to go back too far, but I can remember almost as a young boy hearing Bob Hennigan talk about the possibility of cleaning up Onondaga Lake and some of my uncles saying that guy's crazy.

It's kind of neat, isn't it, Bob, to be here in Washington talking about something that you've been crying out in the calcite desert for years about?

I'm very, very pleased that you stayed with it, because if you hadn't, I'm not sure we all would have or we would even be here.

My mother used to say when we'd drive out Route 690, before there was 690, on State Fair Boulevard, past the lake, she'd say, "you know, whoever figures out what to do with that soda ash is going to be a rich, rich person."

I would submit that there's no easy solution to that, but if we can all figure out what to do with that waste, we're going to be a much richer community for it.

I don't have any questions of you, but I very, very much appreciate your involvement and your support, and we really have to keep the momentum of this thing going.

I would just finish by thanking again the Chairman very, very much for giving us this opportunity to establish a legislative record to give us something to take into conference when we get to that point to help solve a very, very important and serious environmental problem in New York State.

[Mr. Effler's prepared statement appears on page 456.]

[Mr. Spire's prepared statement appears on page 572.]

[Ms. Portmore's prepared statement appears on page 531.]

[Mr. Forman's prepared statement appears on page 468.]

Mr. Nowak. Thank you very much, Mr. Walsh.

Let me just conclude by saying, you know, you made a remark about that church on the hill. You know, prayers do help, and it's that old story about the fighter who was praying just before he went out to fight Tyson in the first round, he prayed to God, and he said will that help, and he said it's going to help if you can fight.

I guess it's sort of the same way here. I was just looking at the Clean Lakes Program, which we tried and we authorized in 1988 at $30 million, and the 1988 presidential request was zero, and no money was appropriated.

Finally, you know, in 1989, we started the program, and the presidential budget contained again that sum of zero, and we did get appropriated, however, $12.5 million of that $30 million, so we started.

In 1990, we have a presidential request of $2 million, appropriated at $8.7 million, and, unfortunately, in the 1991 presidential budget, we're back down to zero.

You know, you can pray a lot, but believe me, it's going to take a little money and a little research technology to start to reverse what has been, and I think that process, from what I can determine very briefly with this overlook, has started.

But the state-of-the-art doesn't exist to any large degree, and we're going to have to spend the kind of dollars that we need to discover the best sources.

It's been mentioned many times, of course, capping could be a much more valuable cost effective way to remediate, and in some areas, that's probably going to be true.

As we move along, however, we also want to make sure that we can invest the federal money, and not spend it, but invest the federal money so that we can then transfer that model technology to other places throughout the United States.

I think that could be a large part of what we end up here doing with the program that's been introduced by Mr. Walsh and by the Senators, and we hope that we can move forward with this program, but, again, I want to talk about the environmental bond issue of New York.

We may have to cost share much heavier than we ever have before, and I hope you keep working on those sources, too, along with the DEC funding.

Again, thank you for your presence. I hope everybody does still make their plane. We will stand adjourned until further notice. Thank you very much.

[Whereupon, at 4:44 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

PREPARED STATEMENTS OF WITNESSES

JIM BATES
44th DISTRICT, CALIFORNIA

COMMITTEE ON ENERGY
AND COMMERCE

COMMITTEE ON
GOVERNMENT OPERATIONS

COMMITTEE ON HOUSE
ADMINISTRATION

CHAIRMAN
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STATEMENT OF THE HONORABLE JIM BATES
before the
SUBCOMMITTEE ON WATER RESOURCES

March 22, 1990

MR. CHAIRMAN, I WOULD LIKE TO THANK YOU FOR GIVING ME THE OPPORTUNITY TO TESTIFY THIS MORNING BEFORE THE SUBCOMMITTEE ON WATER RESOURCES. THE FEDERAL WATER POLLUTION CONTROL ACT AND ITS IMPLICATIONS FOR SAN DIEGO ARE OF GREAT IMPORTANCE TO ME.

THE CITY OF SAN DIEGO IS REQUIRED UNDER THE FEDERAL WATER POLLUTION CONTROL ACT TO TREAT ITS SEWAGE TO THE SECONDARY LEVEL. SAN DIEGO IS CURRENTLY TREATING ITS SEWAGE TO THE ADVANCED PRIMARY LEVEL.

PROTECTION OF THE ENVIRONMENT HAS ALWAYS BEEN ONE OF MY HIGHEST PRIORITIES AND I TAKE PRIDE IN MY ENVIRONMENTAL RECORD. HOWEVER, I THINK IT IS EXTREMELY IMPORTANT TO REMEMBER THAT TECHNOLOGY HAS DRASTICALLY CHANGED SINCE THE REQUIREMENTS OF THE FEDERAL CLEAN WATER ACT WERE ENACTED IN 1972. WE OUGHT TO BE FLEXIBLE AND OPEN TO THIS NEW TECHNOLOGY. WE OUGHT TO CONSIDER HOW WE CAN MEET THE GOALS OF THE FEDERAL WATER POLLUTION CONTROL ACT USING THE LATEST TECHNOLOGY AND SCIENTIFIC FINDINGS.

THE NATIONAL RESEARCH COUNCIL, IN RECOGNITION OF THE FACT THAT WATER POLICIES OUGHT TO BE FLEXIBLE AND SCIENTIFICALLY BASED, HAS UNDERTAKEN A STUDY OF OPPORTUNITIES TO IMPROVE WASTEWATER MANAGEMENT FOR URBAN COSTAL AREAS. THE NATIONAL RESEARCH COUNCIL WILL EXAMINE SAN DIEGO AND ITS SEWAGE TREATMENT PROBLEMS AS PART OF THIS STUDY.

THE CITY OF SAN DIEGO IS COMMITTED TO RECYCLING 50% OF ITS WATER. IF WATER RECLAMATION OR A DEEP WATER OCEAN OUTFALL IS CONFIRMED IN THE NATIONAL RESEARCH COUNCIL STUDY AS APPROPRIATE TECHNOLOGY FOR MEETING THE WATER QUALITY STANDARDS OF THE FEDERAL WATER POLLUTION CONTROL ACT, THEN I BELIEVE SAN DIEGO OUGHT TO BE ABLE TO CONSIDER THESE DIFFERENT APPROACHES.

SAN DIEGO WILL INVEST A LARGE SUM OF MONEY, $2.8 BILLION, TO UPGRADE ITS SEWAGE TREATMENT SYSTEM TO THE SECONDARY LEVEL. I THINK WE NEED TO KNOW THAT IF THE STUDY DEMONSTRATES THAT THIS IS NOT NECESSARY, OR RECOMMENDS DIFFERENT, MORE SCIENTIFICALLY BASED TECHNOLOGY, THAT SAN DIEGO WILL BE ABLE TO PURSUE THESE OPTIONS.

SEVERAL MARINE SCIENTISTS FROM THE SCRIPPS INSTITUTION OF OCEANOGRAPHY IN SAN DIEGO HAVE DECLARED THAT A SEWAGE UPGRADE IS NOT NECESSARY. ACCORDING TO THE MARINE SCIENTISTS, THE EFFLUENT BEING DISCHARGED INTO THE OCEAN IS NOT SIGNIFICANTLY DAMAGING THE ENVIRONMENT. AT THIS TIME I WOULD LIKE TO ENTER INTO THE RECORD THE OPINIONS OF THREE SCIENTISTS FROM THE SCRIPPS INSTITUTION OF

OCEANOGRAPHY: MIA TEGNER, ASSOCIATE RESEARCH MARINE BIOLOGIST, PAUL K. DAYTON, PROFESSOR OF MARINE ECOLOGY, AND RICHARD EPPLEY, RESEARCH OCEANOGRAPHER.

AGAIN, THANK YOU, MR. CHAIRMAN FOR THIS OPPORTUNITY. IT IS MY SINCERE HOPE THAT WE CAN FIND THE MOST SCIENTIFICALLY BASED, ENVIRONMENTALLY AND FINANCIALLY SOUND, WAYS TO DEAL WITH OUR WATER POLLUTION PROBLEMS.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

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INSTITUTE OF MARINE RESOURCES
SCRIPPS INSTITUTION OF OCEANOGRAPHY

LA JOLLA, CALIFORNIA 92093-0218

June 15, 1989

Councilman Bruce Henderson
202 C Street
Mail Station 10A
San Diego, California 92101

Dear Councilman Henderson:

I am one of the oceanographers familiar with the sea off San Diego who view secondary waste treatment with ocean disposal as unnecessary and a wasteful expenditure.

My expertise is in the relation of plankton growth in the ocean to plant nutrients, such as nitrates and phosphates. Secondary treatment will not decrease the quantity of plant nutrients released to the ocean. It will, however, more completely convert particulate organic nitrogen to soluble, mineral forms readily used by the plankton. If anything, secondary treatment will increase the release of plant nutrients directly useable by the plankton. In the past we have not been plagued with nuisance plankton blooms in response to nutrients from the waste treatment outfall at Point Loma. I don't expect we will be in future, even with secondary treatment. Nevertheless, the probability of such blooms occurring, however small, can only be increased by secondary treatment.

Yours sincerely,

Richard W. Eppley
Research Oceanographer

CC: Congressman Jim Bates

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SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA, CALIFORNIA 92093

Congressman Jim Bates
c/o Jay Hansen
224 Cannon Building
Washington DC 20515

July 4, 1989

Dear Congressman Bates,

Elaine Brooks has asked me to write you a letter detailing my position regard the need for a secondary treatment plant at Point Loma for the San Diego sewage. I have worked since 1970 on the Point Loma kelp forest and in the late 1970's and early 1980's served on the advisory board for the Southern California Coastal Water Research Project. Thus I have considerable familiarity with the local kelp forest and some familiarity with southern California outfalls.

In my opinion the present outfall has no important biological effect on the Point Loma kelp forest at all. This is a reasonable statement but is not universally accepted, so I would like to qualify it with the following caveat: the southern part of the kelp forest actually is heavily stressed and there is a possibility that this stress results from the outfall. However, in my mind there is a great deal of support for the hypothesis that the stress is caused by the effluent from the San Diego Bay and even perhaps the Tiajuana sewage. The reason I say this is that there does seem to be a general northward trend to the coastal longshore currents. Indeed, when the coliforms (which must come from the outfall) do show up, they tend to be to the north of the outfall. So I believe that the Bay effect goes northward from the bay and the outfall effect would be to the north of the pipe. Yet the northern part of the kelp forest is the healthiest (judged by the growth and survivorship of the kelps). The coliform bacteria are the only unequivocal outfall indicators to reach the kelp forest; they do so rarely in the winter when the thermocline breaks down. While coliforms themselves are not a problem, they could indicate the presence of other pathogens. While people have looked for it, so far as I know there has never been any indication of disease from the few people diving in the out kelp forest in the winter. This is an indication of occasional outfall effluent getting to the kelp forest, b we have certainly never seen any indication that the natural community is effected in any way. So, ~~while~~ I feel very confident and have made public statements to the fact that so far as the kelp forest goes, even the present pipe does not cause any important biological effects on the kelps. Nevertheless, something (I believe the Bay) is stressing the southern part of the kelp forest and some simple research could separate the bay and pipe effects.

Finally, the San Diego outfall __does__ have some effects on the local benthic community in the vicinity of the outfall. It is impossible for a pipe to have __no__ effects and at Point Loma some populations are suppressed and some are enhanced, but in all cases the effects are manifested in remarkably small spatial scales and so far as I know, no species are even locally extinct. The San Diego outfall is relatively very clean and a simple pipe extension would virtually eliminate even those effects such as the rare coliform counts at the outer kelp forest in the winter.

Summarizing, there __are__ effects, but biologically, they are trivial and this is the reason I have so strongly argued against spending so much money on a secondary treatment facility. I genuinely believe that San Diego has a clean outfall and from a ecological perspective, secondary treatment is not necessary.

There are two important caveats I want to add. First, the condition of the "plumbing" of the system is an outrage: there are far too many spills and leaks and other breakdowns and the storm drains do throw raw sewage into the surf almost every time there is a significant rain. Clearly the system is overloaded and the "plumbing" must be repaired and some sort of population growth restrictions placed on the region, at least until the system can handle its sewage! Second, I know virtually nothing about the water reclamation component of the planned treatment facility. This entire issue should be debated separately; my position is that the marine ecology argument for secondary treatment is utterly lacking and if the treatment is to be purchased, the expensive purchase must be predicated solely on water reclamation issues, not on protecting the ocean from an ecologically trivial impact.

Sincerely yours,

Paul Dayton

Paul K. Dayton
Professor of Marine Ecology

UNIVERSITY OF CALIFORNIA, SAN DIEGO

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SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA, CALIFORNIA 92093

A-001

July 31,1989

Congressman Jim Bates
c/o Jay Hansen
224 Cannon Building
Washington, D. C. 20515

Dear Congressman Bates:

As a kelp forest ecologist at Scripps Institution of Oceanography with fifteen years of research experience in the Point Loma kelp forest, I would like to comment on the EPA's requirement that we institute secondary treatment of San Diego's sewage. Secondary treatment is highly appropriate for discharge into freshwater (especially when downstream communities will be drinking from the same source), estuaries, and confined marine bays where the dilution factor is relatively low. It makes no sense scientifically-and certainly not fiscally-to spend billions of dollars on secondary treatment when the discharge site is in deep water on an energetic, open coast. The only apparent rational is EPA's desire to have a single standard for secondary treatment for its own administrative convenience.

San Diego is out of compliance with California Ocean Quality Standards in two areas. First, coliform counts are above standards in deep water on the outer edge of the Point Loma kelp forest a few days a year, generally on occasions when the thermocline breaks down during the winter. There is no evidence that this has caused public health problems to date, either among our team of five research divers who make about a thousand dives at Point Loma annually, or with the public at large. Nevertheless, the potential of a public health problem is there and should be dealt with. Despite its price tag, secondary treatment does not affect coliform levels. A simple extension of the outfall about 1.5 miles further offshore into deeper water should solve this problem.

The second issue involves the benthic community in the immediate vicinity of the outfall. The San Diego discharge, which is relatively very clean for a major metropolitan area, has not led to anoxic sediments or to pathological incidences such as finrot in fishes. Some invertebrate populations are enhanced while others are depressed, but even these effects are over very small spatial scales. The EPA talks about the need for "balanced, indigenous populations" and the law requires there to be no effects. I believe that it is impossible for a discharge to have no effects and further contend that we must balance these small changes to benthic populations with the negative effects of secondary treatment. Professor John Isaacs of Scripps, who studied this sewage issue intensively, brought up the problem of the effects of secondary treatment on the valence states of some metals. The oxidation process renders some toxic materials in sewage, notably mercury and chromium, thousands or even millions of times more toxic than they were in the reduced state. Furthermore, the benefits (and there is no proof that secondary treatment will restore "balanced, indigenous populations") should be balanced against the tremendous terrestrial environmental costs--the land and energy requirements and air quality effects entailed by secondary treatment and the subsequent disposal of the huge volume of wastes generated by this process.

I strongly believe that this issue of secondary treatment for dischargers on open coasts merits Congressional action. The present system makes no sense scientifically and we certainly can put this incredible sum of money to better use. If I can be of further assistance, please contact me.

Sincerely,

Mia Tegner

Mia Tegner
Associate Research Marine Biologist

cc Elaine Brooks

STATEMENT OF CONGRESSMAN BEN BLAZ
IN SUPPORT OF HIS AMENDMENT
TO CLEAN WATER ACT REAUTHORIZATIONS

Before the House Subcommittee on Water Resources

March 22, 1990

Mr. Chairman, I wish, first of all, to thank you for giving me this opportunity to testify in support of my proposed amendment to the Clean Water Act Reauthorization measure before this subcommittee. The issue is of some urgency to my District since Guam stands to lose $619,000 in FY 1989 funding and another $4.73 million in wastewater treatment construction grants through FY 1994 unless remedial legislation is enacted by September 30th of this year.

Very briefly Mr. Chairman, as you are aware, the Federal Water Pollution Control Act amendments of 1987 mandated the phaseout of construction grants for wastewater treatment facilities by FY 1991. In its place, a State Revolving Fund Program (SRFP) was instituted. Under the program, States receiving such funds can no longer treat them as grants. Instead, States are required to loan this money out at interest to local municipalities for construction financing - the State to be repaid by County and Municipal governments through a user fee or tax mechanism. In this way, it is hoped that wastewater treatment facilities will become self-sustaining and that a continued "pool" of construction money will result from interest and reimbursement to the States from municipal governments.

Mr. Chairman, the SRFP concept is a commendable one. However, in the case of Guam it is impractical. This is so because Guam-unlike the States - does not have an hierarchal structure to its government. There are no county, municipal or public entities separate or distinct from the Government of Guam.

As a result, the Territory finds itself placed in the rather ludicrous position of being forced to lend money at interest to itself in order to make use of SRFP funds.

Aside from impracticality, there are other concerns which make the SRFP concept inappropriate for Guam. As an unincorporated territory, there are serious legal questions as to whether the Government of Guam is authorized under its Organic Act to lend money to itself. Secondly, it is extremely doubtful that Guam could reorganize its government - even if it desired to do so- within the September 30th deadline mandated under the 1987 amendments to the Federal Water Pollution Control Act. Finally, requiring the Government of Guam to lend money to itself at interest defeats the very purpose to which the SRF Program was intended - namely to provide a continuous source of construction funding. Instead, construction costs will be needlessly increased.

Mr. Chairman, Guam's share of SRFP funding through FY 1994 is $5.349 million - $619,000 of which has been earmarked for FY 1989. The attached amendment seeks to treat this money as direct construction grants under Title II. The wording of my proposed amendment is virtually identical to the language contained in a previous provision which passed the House in 1988 but failed to be enacted partly due to an unrelated disagreement in the Senate.

As can be seen from the attached letter from the Acting Assistant Administrator For Water, dated July 28, 1989, the Environmental Protection Agency is in support of this amendment-so long as Guam and the other insular areas formulate funding mechanisms to ensure that future needs are met.

Mr. Chairman, $5.349 million is desperately needed to fund the the EPA-approved Agat/Santa Rita Treatment Plant, as well as the Joint Outfill projects. Moreover, as a result of unprecedented growth in the local economy, the Government of Guam recently floated a revenue bond to improve and expand its water system. These capital improvements are expected to replace the antiquated distribution lines and pumping stations installed by the U. S. Navy more than 40 years ago in the aftermath of World War II. However, unless additional treatment facilities are constructed, operation of the improved system will be in jeopardy since Guam was and is relying on Title II grants for that phase of construction.

I might add that successful operation of the new system will be in the interests of the United States Government in that the planned improvements will greatly reduce reliance on Navy water resources which supply southern Guam's civilian needs.

In conclusion, Mr. Chairman, for the reasons stated above, I respectfully request that the attached amendment be included in any Clean Water Act Reauthorization measure adopted by this august subcommittee. Thank you.

PROPOSED AMENDMENT

BY MR. BLAZ

RELATIVE TO WASTE WATER TREATMENT IN INSULAR AREAS

"The Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands, the Federated States of Micronesia, the Marshall Islands, and Palau may each elect in any fiscal year to treat funds made available to them under title VI of the Act of June 30, 1948 (Chapter 758; 62 Stat. 1155), as amended, as if such funds were made available under section 207 of such Act beginning with fiscal year 1989. Notwithstanding any other provision of law, funds subject to section 207 of such Act by reason of such election shall not be subject to any of the provisions of title VI of such Act."

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 28 1989

OFFICE OF
WATER

Honorable Ben Blaz
House of Representatives
Washington, DC 20515

Dear Mr. Blaz:

Thank you for your letter of July 10, 1989. Mr. Quinn has asked me to offer my thoughts on Governor Ada's proposal to allow the Agency, at the request of certain island governments, to award grants for the construction of wastewater treatment facilities, rather than for capitalizing State water pollution control revolving funds under title VI of the Clean Water Act.

Similar proposals were first made in the Omnibus Insular Areas Act of 1988 and in the Senate's version of the fiscal year 1989 Housing and Urban Development/Independent Agencies appropriations bill. In neither case did the proposals become law.

Recently, Chairman J. Bennett Johnston of the Senate Committee on Energy and Natural Resources sought the Administrator's opinion on a proposal from the Pacific Basin Development Council that would permit only the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands and Palau to receive funds made available under title VI as construction grants. The Administrator indicated his support if the proposal also required the islands to set up funding mechanisms, such as taxes or user fees, to ensure that future needs can be met without additional Federal grants.

As Governor Ada has noted, the State Revolving Fund (SRF) concept is most effective in instances where one level of government (a State) awards loans to another level of government (a municipality). It may not be appropriate in some of the islands, where there is really only one level of government. However, as the Federal government's role in sewage treatment financing ends in 1994, it is important for the islands to begin to set-aside funding for future capital expenditures. Therefore, any proposal to allow SRF allotments to be awarded as grants should also contain provisions to ensure that the islands are prepared to finance future sewage treatment construction.

Governor Ada has also noted that legislation providing an exemption from the SRF program must be acted upon in a timely manner in order for the island governments to benefit from funds available to them. Under the Act's provision for reallotment of unobligated funds, governments that decline to participate in the SRF program by October 1, 1990, will lose their title VI allotments for fiscal year 1989.

I hope this letter addresses your concerns. Please call me if you have further questions or have your staff contact Michael J. Quigley, Director, Office of Municipal Pollution Control on 382-5850.

Sincerely yours,

Rebecca W. Hanmer

Rebecca W. Hanmer
Acting Assistant Administrator
for Water

[illegible]
[illegible]

[illegible]

APR 1 0 1989

The Honorable Ben Blaz, M.C.
Member of Congress
Congress of the United States
1130 Longworth House Office Building
Washington, D.C. 20515

Dear Congressman Blaz:

The Federal Environmental Protection Agency, acting in response to a schedule and mechanism set forth in the Federal Water Quality Act of 1987, is completing the transition of regulatory authority for water supply and waste disposal management to full local responsibility.

EPA's authority to allot funds to the States including Guam for construction grants is continued through fiscal year 1990. After which EPA has authority to make grants to capitalize State Water Pollution Control Revolving Funds (SRF's) for the purpose of providing loans and other financial assistance to local municipalities for the construction of wastewater treatment facilities, implementation of the non-point-source management program and the implementation and development of plans under the new Estuaries Protection Program.

The last year in which funds will be appropriated for direct project funding through construction grants is 1990. Separate appropriation for SRF capitalization grants are authorized from Fiscal Year 1989 through Fiscal Year 1994. The SRF capitalization program is very specific on how to disburse these funds. It cannot be used by the State to award grants. It can only be used to provide loans to local municipalities for financing the construction of wastewater treatment works and should be repaid back to the State with interest for a period not to exceed 20 years.

I feel Guam should be exempted from the implementation of Title VI of the Water Quality Act of 1987, primarily because the Owner and Operator of the wastewater treatment facilities in Guam is the Government of Guam. There also remains a question of legal legitimacy with Guam's implementation of SRFs, which would require the Government of Guam to provide loans to itself for the construction of its wastewater treatment works and later repay itself with interest.

As you may recall, legislation was proposed last year to effect this exemption but, for a variety of reasons, failed to be enacted. The House of Representatives, in recognizing that the SRF concept is not compatible with the current government operation of Guam, American Samoa and the Commonwealth of the Northern Mariana Islands, passed a provision in the last Congress that would allow EPA to treat funds appropriated for SRF capitalization as if they were grant funds under Title II of the Act. However, the provision was not passed by the Senate. Again, I wish to reiterate our proposal that a provision be included in the Omnibus Territorial legislation or other appropriate legislation when such is developed during the current session of Congress, which would have the funds to be allocated to Guam under the SRF Program, be available in the form of direct construction grants.

As you may be aware, Guam was allotted SRF funds in the amount of $0.619M for FY'89 and, if this amount cannot be obligated before the end of FY'90 (treated as a construction grant), Guam will lose the $0.619 M allotment. Having the total of approximately $5 million in SRF allotted funds through FY '94 available as grants would provide Guam the best use of such funds.

Enclosed please find a copy of a proposed provision to the Omnibus Territorial Legislation. I am requesting your assistance in having the provision included in an appropriate legislation that may be developed by the current Congress.

Your early action on this matter is greatly appreciated.

Sincerely yours,

Joseph F. Ada

JOSEPH F. ADA
Governor of Guam

Enclosure

PROPOSED AMENDMENT FOR INCLUSION TO THE TERRITORIES OMNIBUS BILL

> "At the request of the Chief Executives of American Samoa, Commonwealth of the Northern Marianas Islands, Guam, Republic of the Marshall Islands, Federated States of Micronesia and Republic of Palau, funds made available under Title VI of the Federal Water Pollution Control Act, as amended, for capitalization of water pollution control revolving funds shall be treated as though they were funding under Section 207 of the Federal Water Pollution Control Act, as amended."

Title VI of the Federal Water Pollution Control Act, is amended by adding at the end thereof the following new section:

"Section 608. Insular Areas -- Notwithstanding any other provision of this title and upon request of the chief executive of the insular area, the Administrator of the Environmental Protection Agency shall, for any fiscal year, treat funds made available under this title to the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, Republic of the Marshall Islands, Federated States of Micronesia and the Republic of Palau, as if such funds were made available under Section 207. Funds made available by such election shall not be subject to any of the provisions of this title (other than this section)."

The 1987 Amendments to the Federal Water Pollution Control Act added a new Title VI to the Act. Title VI establishes a program under which E.P.A. can provide grants to States to capitalize water pollution control revolving funds. Capitalization grants are authorized from Fiscal Year 89-94. As revolving funds are established in the States, the existing federal grant program established under Title II for construction of wastewater facilities phases out by Fiscal Year 1991. Once capitalized, the revolving funds are designed to become self sustaining through loan repayment to the fund from municipal, intermunicipal, interstate or state agencies. Generally, in the insular areas, the territorial/national governments have primary responsibility for constructing and operating wastewater systems. The concept of a revolving fund would translate into the territorial/national government giving itself a loan and then repaying itself from other sources of funds.

The proposed section would allow funds appropriated under Section 607 to be awarded as project grants under Title II rather than for capitalization of revolving funds, if that is the desire of the insular area.

U.S. Senator Al D'Amato
of New York

FOR IMMEDIATE RELEASE

CONTACT: Frank Coleman (202) 224-6498
Zenia Mucha (212) 736-3865

STATEMENT BY SENATOR ALFONSE M. D'AMATO
HOUSE SUBCOMMITTEE ON WATER RESOURCES
MARCH 22, 1990

"We in the Congress have been doing what we can to help. Last year we appropriated $500,000 for the establishment of the Lake Management Conference.

"Senator Moynihan has been able to incorporate authorization for the Lake Management Conference and for cleanup of the Lake into the Water Resources Development Act, S. 2183.

"While the price tag for the cleanup has been estimated to be $100 million over 6 years, S. 2183 does not include any specific authorization for appropriations.

"But our efforts in Congress are not enough. We must have more direct involvement by the federal government, in particular, the EPA. Here the much needed assistance has been less than forthcoming.

"Thus far it has been the State that has filed a lawsuit seeking cleanup from the Allied Chemical Company. It has been the State that has devoted resources to bringing polluters to justice.

"While I have no doubt that this legal action will be forcibly pursued, it is my strong opinion that the federal government should be involved in insuring that a cleanup occurs and that compliance with all environmental laws is strictly enforced.

"What we need is aggressive federal action. What we need is a lawsuit. But what we have is a U.S. Attorney who is prepared to go forward with such a suit but cannot get EPA to request that such an action be taken. Why is EPA dragging its feet on this?

"The Regional Administrator has informed me that the EPA is currently re-evaluating the criteria necessary to determine a site's eligibility to the National Priorities List. Onondaga Lake is not eligible for Superfund assistance under the present criteria. This on going re-evaluation process allows for the possibility that Onondaga Lake may one day be added to the National Priorities List. This evaluation is expected to be finalized later this year.

"While I certainly applaud the re-evaluation process, that is something that is still far off in the future and does not provide any guarantees that Onondaga Lake will meet these new criteria. For that reason I strongly encourage the EPA to pursue a federal lawsuit.

-over-

"By way of history, the Clean Water Act was passed by Congress in 1972. In the early years, the federal government, through the EPA, issued all necessary permits for the discharge of pollutants into Onondaga Lake and all other bodies of water within New York State. In October of 1975, New York State took over that authority from the EPA, but the EPA continues to monitor any permits that are issued.

"It is commonly recognized that Allied Signal was the principle polluter of the Lake. Allied closed its facility in 1985. It is clear from this brief chronology that serious pollution occurred while the federal government was directly or indirectly in charge of permits. Thus, the federal government bears an equal share of the responsibility for harm to the Lake. So why the inaction?

"Citizens throughout the United States have looked to the federal government to take the lead in ensuring compliance with our environmental laws. This is an opportunity for the federal government to show its commitment to aggressively take on polluters. It will send a clear message to those who continue to pollute our environment that the federal government will not tolerate such behavior."

****

WRITTEN TESTIMONY FOR HEARING
ON ONONDAGA LAKE

MARCH 22, 1990

STEVEN W. EFFLER
UPSTATE FRESHWATER INSTITUTE

MY BACKGROUND

I'm a research engineer and scientist for, and member of the board of directors of, the Upstate Freshwater Institute, Inc. (UFI), a not-for-profit research corporation dedicated to freshwater research. I was born and raised in Syracuse. I've been involved in the study of Onondaga lake since the mid-1970's. This effort has been funded since 1987. My investigations have been interdisciplinary in nature, including the biological, chemical, physical, and engineering aspects of the lake's problems. A listing of my professional contributions that have evolved from these efforts is appended to this testimony. Since 1987 I have served as project manager and as a principal investigator of a multi-institution, interdisciplinary effort to develop water quality models to guide remediation of certain of Onondaga Lake's problems.

I have maintained a more global perspective on lakes and water quality during this time through the research of a number of other lakes and through the professional literature. I have prepared more than 40 professional reports, and published more than 30 articles in peer-reviewed national and international environmental journals concerning lakes other than Onondaga Lake. Further, I have served as a reviewer for 5 different international journals, that publish articles addressing water quality problems throughout the United States and from around the world.

ONONDAGA LAKE WATER QUALITY: HOW BAD IS IT?

Onondaga Lake and it's tributaries have been greatly impacted by both domestic and industrial wastes. **Onondaga Lake has been described as the most polluted lake in the United States.** Of course there is no universally accepted water quality rating system by which to verify this position. However, **I am unaware of another lake in the United States, or elsewhere, that suffers from the myriad of problems that are manifested in Onondaga Lake.**

A number of water quality and related criteria, established by local, state, and federal regulating agencies, are violated routinely in Onondaga Lake. **The lake is closed to swimming and fish from the lake cannot be eaten.** These conditions are at odds with the national goal to make all surface waters fishable and swimmable by July of 1988 (Section 101 of the Clean Water Act). Table 1 identifies six different criteria that are routinely violated in the lake, and the related concerns. Undoubtedly other criteria are contravened that are not yet documented for the lake. The lake and its tributaries have a number of other problems that cannot adequately be described from the perspective of criteria. A listing of some of the more important problems is presented in Table 2.

TABLE 1: CRITERIA ROUTINELY VIOLATED IN ONONDAGA LAKE

Resource Affected	Parameter	Related Concerns
swimming		
	low clarity	swimming safety
	high fecal bacteria concentrations	public health
fishery		
	mercury contamination of fish flesh	public health
	low oxygen concentrations	fish habitat/ survival
	high ammonia concentrations	fish toxicity
	high nitrite concentrations	fish toxicity

CHALLENGES AND OPPORTUNITY

The various individual problems of Onondaga Lake and its tributaries (Tables 1 and 2) are not unique to this lake, though perhaps no other system suffers from so many problems. The restoration of Onondaga Lake represents not only a major technical challenge, but also a major opportunity. A complete scientific and engineering understanding of the system will be essential to support remedial efforts. This would necessarily be accompanied by the advancement of related scientific and engineering disciplines. Innovative engineering approaches and designs will be needed to restore the lake and its tributaries. The overall effort will result in an improved capability to address complex environmental remediation problems that will have nation wide benefit.

REASONS FOR OPTIMISM: ONONDAGA LAKE

Despite the highly degraded conditions that continue to prevail in the lake, there are some reasons for optimism. First, the lake has demonstrated positive response to recent reductions in material loading. Yet further reductions in material loading will be necessary to reach water quality goals and reclaim related resource uses. A second reason for optimism is the recent initiation of scientific and engineering studies that promise to provide reliable management tools, in the form of mathematical models, to guide the remediation of several of the lake's problems. The problems presently being addressed are indicated in Table 2.

TABLE 2: WATER QUALITY RELATED PROBLEMS OF ONONDAGA LAKE AND TRIBUTARIES

PROBLEMS	PRESENTLY UNDER INTENSE INVESTIGATION
LAKE	
1. high concentrations of ammonia	x
2. low transparency	x
- high loading of phosphorus	
- high concentrations of phytoplankton	
3. low concentrations of dissolved oxygen	x
4. high concentrations of fecal coliforms	x
5. mercury contamination	
- fish flesh	
- sediments	
6. sediment releases	
- nutrients	
- toxics	
7. high sedimentation rates	
8. chlorobenzene contamination	
9. ionic enrichment	
10. altered near-shore sediments	
11. altered food chain interactions	
12. impact of lake releases on river quality	
ONONDAGA CREEK	
1. high concentrations of fecal bacteria	
2. high concentrations of suspended solids/"mud boils"	
3. high concentrations of phosphorus	
4. low transparency	
NINE MILE CREEK	
1. deposits	
2. inputs from waste beds	

LIMITATIONS: TIME AND SCOPE

It should be recognized that water quality modeling has only recently been embraced by regulators as a valuable management tool for Onondaga Lake. Further, the scope of these recently initiated efforts fails to address a number of the problems of the lake and its tributaries (Table 2). Particularly conspicuous by their absence in on-going studies are the problems of mercury, the interaction between the lake's sediments and water quality, and the sediment load carried by Onondaga Creek. Since the recognition of contamination of fish flesh and the sediments in the early 1970's no systematic evaluation of the cycling of mercury in the lake has been conducted. Further, we must understand and quantify the exchange processes between the lake sediments and the overlying water column to determine the extent to which the sediments will impede the recovery of the lake. The other problems indicated in Table 2 also deserve attention.

A WORD OF CAUTION

Many of the lake's problems (Table 2) interact directly or indirectly. Thus it is important to develop a quantitative understanding of all the interacting components. A management approach that focuses on only one component risks making a short-sighted decision that may subsequently be obviated or even found to be inappropriate. Further, it is extremely important that a high degree of interaction be maintained between the scientists and engineers, involved in model development, and the water quality managers and facility designers, so the models can be designed to best serve the remediation needs of the lake.

RESEARCH CONTRIBUTIONS FOR ONONDAGA LAKE
-BY STEVEN W. EFFLER

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A. ONONDAGA LAKE AS THE PRINCIPAL TOPIC

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H.R. , THE ONONDAGA LAKE RESTORATION ACT OF 19[90]
INVITED TESTIMONY BEFORE
THE SUBCOMMITTEE ON WATER RESOURCES,
OF THE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION
HEARING
22 MARCH, 1990

DONALD FORMAN
DIRECTOR FOR CLEAN WATER PROGRAMS
ATLANTIC STATES LEGAL FOUNDATION, INC.

I am very pleased today to be able to testify before this committee on a subject vital to Central New York, namely restoring Onondaga Lake. The environmental community as a whole joins me today in thanking you, Representative Walsh, for introducing H.R. and for spear-heading these efforts, and you Representative Nowack for convening this hearing.

When I first moved to Syracuse, it was a little shocking to be told that Onondaga Lake was the most polluted in the country. I heard talk about how it had been a valuable resource to the community in the past, and yet how today it is so polluted that we lack the technology to clean it up, or even to know if it can ever be fully restored.

Yet a cleaner lake is a necessity for a healthy environment and a healthy community in Central New York. A clean lake will be an economic boon not just by allowing further development but as an attraction to Central New York and a recreation resource for all of us. A clean lake will put Syracuse on the map as a success story without peer. It will be a morale booster of incalculable worth.

Onondaga Lake must be cleaned up for yet an even more important reason. Onondaga Lake flows into the Oswego River and its waters then enter Lake Ontario. The Great Lakes are the world's largest repository of fresh water and all steps must be taken to prevent their further degradation. In much of Onondaga County, residents drink water from Lake Ontario. For preserving that supply all pollutants entering Lake Ontario must be eliminated.

Further, under the auspices of the International Joint Commission and the revised United States-Canada Water Quality Agreement this nation has a treaty commitment to remediate toxic hotspots in the Lake system. There are forty-two areas now designated as needing such special attention. One of these is the Oswego Harbor through which all of the pollution in Onondaga

Lake eventually flows. The Oswego Harbor Remedial Action Plan Committee, of which Atlantic States's President, Samuel H. Sage, is co-chair, believes that clean-up of Onondaga Lake is necessary in order to clean up the Oswego Harbor.

We can support passage of H.R. , the Onondaga Lake Restoration Act of 19[90], only with certain changes and clarifications.

Past infusions of money have not solved the problems of the Lake. Reasons have related to intensive opposition from industrial dischargers, to often misguided abatement policies and programs by the sanitary district, to lack of funds, and finally to our not knowing what to do. I will discuss each of these in turn.

In the past much of the south and west shoreline of the Lake has been ringed with industrial development that mirrored the Syracuse area's place as a producer of basic chemicals and their derivatives. Activities related to water transportation as an important port on the inland canal system of New York also continue to cause problems. Many of these industries were amongst the most recalcitrant in America and required repeated enforcement actions trying to bring them into compliance with environmental laws. Atlantic States itself brought actions against three major polluters directly discharging into the Lake. Often the power and influence of these industrial giants has led to less than the most aggressive regulation by the state to begin with, so that many discharges into the Lake were deemed "legal". One industry was the subject of a major investigation by the federal government which led to a criminal conviction of the company and its top executives. Hopefully direct discharges are abating, and this form of pollution of the Lake should become less of a factor. Indirect discharges of chemicals into the Lake are another matter, as industrial pretreaters, runoff from hazardous waste dumped decades before, and air deposition continue to plague the Lake. Passage of air toxics legislation is needed to help with some of this and more aggressive enforcement of state and federal Superfund laws could help with other parts.

The situation with municipal water pollution control is not much better. For more than two decades the local environmental community has been actively involved with trying to get proper abatement of sewage from all county and city sources. Upon passage of the Federal Water Pollution Control Act we pushed hard for a complete environmental impact statement analyzing the then proposed Metropolitan Sewage Treatment Plant. We felt at that time, and still feel, that the plant was the wrong design, built in the wrong place, and that it would not adequately handle the sanitary wastes in a manner that would lead to maximum benefits to the Lake. Unfortunately we have been proven correct. Recent litigation by Atlantic States (joined by the State of New York) concluding in a consent order, put the county on a road to possible, albeit expensive, solutions to these and more recent problems at the sewage treatment plant and other sewer discharges in the Lake. Although the consent order requires certain studies, and although with federal and state assistance certain pump station problems are being rectified, there is still no funding mechanism in place for full implementation of the order. A copy of the consent order is attached to this testimony and should be included in the record of this hearing.

Funding for different parts of the solution to the Lake's problems will need to come from different sources. One of our chief concerns is that federal funding be well targeted--that it be spent effectively, and on efforts that would not find alternative sources of funds. I can specify several important efforts which should be excluded from federal funding.

First is the full implementation of improvements to the County sanitary system pursuant to the consent order. The order will require the expenditure of hundreds of millions of dollars. If federal money is allowed for this purpose, it can drain a large part of the available federal funding without achieving any results that are not already mandated by the order and that would not happen anyway. The efforts to comply with the order can and should be paid for by user fees for the facilities that must be constructed. Expansion of the treatment plant beyond what was envisioned originally should be borne by the new users and not by older neighborhoods or general tax revenues. To finance sewage treatment improvements through federal general funds at this late date would violate the equity of the funding priority system of Title II of the Clean Water Act, which was designed to fairly apportion federal sewage treatment money throughout the country. Corrections for past mistakes should be paid for by individuals, if they were deliberate violations of sewer ordinances such as illegal hook-ups of storm drains. Finally corrective actions to the system as a whole must be borne by the unfortunate tax-payer or as user fees, after full investigation as to why in essence double payment is needed to get the job done.

A second category to be excluded is other projects which can be funded from other sources. The State of New York now has a major natural resources damage case, and we are urging them to aggressively investigate responsible parties for other such action. The responsible parties should pay for repairing such damage, not the federal taxpayer.

FEB 6 1989

COPY

IN THE
UNITED STATES DISTRICT COURT
FOR THE
NORTHERN DISTRICT OF NEW YORK

U. S. DISTRICT COURT
N. D. OF N. Y.
FILED

FEB - 1 1989

AT ____ O'CLOCK ____ M.
J. R. SCULLY, Clerk
BINGHAMTON

---X

ATLANTIC STATES LEGAL FOUNDATION and STATE OF NEW YORK and THOMAS C. JORLING, Commissioner of the New York State Department of Environmental Conservation,

Plaintiffs,

-against-

THE ONONDAGA COUNTY DEPARTMENT OF DRAINAGE AND SANITATION and ONONDAGA COUNTY, NEW YORK;

Defendants.

---X

JUDGMENT ON CONSENT

88-CV-0066
JUDGE MCAVOY

WHEREAS, plaintiff Atlantic States Legal Foundation ("ASLF") filed a complaint against defendants Onondaga County Department of Drainage and Sanitation and Onondaga County alleging violations of 33 U.S.C. §§ 1311(a) and 1311(b)(1)(B) in the discharge of sewage to the Onondaga Lake from Onondaga County's metropolitan sewage treatment plant ("plant") and various overflow points; and

WHEREAS, plaintiffs State of New York and Thomas C. Jorling, Commissioner of the New York State Department of Environmental Conservation ("DEC"), intervened as plaintiff alleging that the defendant has violated the New York State Environmental Conservation Law ("ECL") §§ 17-0509 and 17-0511 by failing to provide the level of treatment required under the law within the period specified by discharging sanitary sewage to the Onondaga

Lake and other waters in the State from the service area of the plant in Onondaga County, New York; and

WHEREAS, the plaintiffs and defendant have agreed to settle this litigation upon the terms set forth below, and have further agreed upon a timetable and schedule attached as Exhibit "A" and incorporated by this reference, which will bring the discharges into compliance with legal requirements through an upgrading project; and

WHEREAS, the defendant has agreed that it will award contracts for part of the upgrading project on the Ley Creek and Liverpool pump stations in March, 1989; and

WHEREAS, the parties agree to the plaintiffs' continued authority to seek $25,000 per violation per day in penalties from defendant for violations of the Clean Water Act under §§ U.S.C. 1365 and §§ U.S.C. 1314[d] and/or $25,000 per violation per day in penalties for violations under ECL Article 17 or the applicable State Pollutant Discharge Elimination System ("SPDES") permit not specifically covered by this judgment; and

WHEREAS this Court has jurisdiction over the subject matter of this action and has personal jurisdiction over the parties to this judgment; and

WHEREAS, the parties agreed to hold a public meeting, upon due and proper notice, to announce and present the terms of this judgment to the public. The meeting took place on December 13, 1988. The transcript of the hearing is filed herewith.

WHEREAS, the parties consent to the entry of this judgment permanently enjoining and restraining the defendant as specified below, without trial or adjudication of any issues of fact or law, and the Court having duly considered the matter and having been duly advised:

NOW THEREFORE, upon the application of plaintiff ASLF and Robert Abrams, Attorney General of the State of New York, and the consent of all parties to this action as evidenced by the signatures of their attorneys below, it is hereby

ORDERED, ADJUDGED AND DECREED as follows:

1. The defendant is permanently enjoined and directed to complete planning, design and construction of the work set forth in the schedule annexed as Appendix A and incorporated by reference in this judgment irrespective of the availability of financial assistance from Federal, State or other sources.

2. Representatives of defendant, ASLF and DEC shall meet at least once every three months to discuss and address any and all progress and problems in the planning, design and construction of the work set forth in Appendix A.

3. In the event that the defendant fails to meet any milestone date in the schedule set forth in Appendix A of this decree, plaintiff(s) shall have judgment payable to the State of New York against defendant by way of a stipulated penalty in the amounts set forth for each day of violation:

PERIOD OF NON-COMPLIANCE	PENALTY PER DAY
1st Day through 30th Day	$ 1,500
31st Day through 40th Day	3,000
41st Day through 50th Day	8,500
51st Day through 60th Day	12,000
Each day beyond the 60th Day	15,000

The judgment shall become due and payable on the day following the next subsequent relevant milestone date on the schedule, and, if the missed milestone has still not been achieved when the judgment amount becomes due and payable, accrued judgment amounts shall become due and payable daily thereafter until the missed milestone is achieved. As used in the preceding sentence "next subsequent relevant milestone" means the milestone date immediately following the missed milestone on the affected schedule.

4. In the event that the defendant fails to meet any of the effluent limits contained in the interim limitations as set forth in Appendix B, plaintiff(s) shall have judgment payable to the State of New York against the defendant(s) for a stipulated penalty in the amounts set forth below:

a. For violation of maximum daily effluent limits:

Total Violations per month	Penalty Per Parameter For Violation of Limitations For Non-Toxic Pollutants
1-2 Violations/month	$ 500.00
3-4 Violations/month	1000.00
5-9 Violations/month	2000.00
10-30 Violations/month	5000.00

b. Violation of the average monthly limit for each parameter shall incur a stipulated penalty of $5,000 per parameter violated.

c. Violation of the average seven day limit for each parameter shall incur a stipulated penalty of $2,500 per parameter violated.

d. Violations of applicable priority pollutant levels for toxic substances, shall incur a stipulated penalty in the amount one and one-half times the penalty set forth for violations of the non-toxic pollutants in paragraph FOUR (a), above.

e. If plaintiffs State of New York and/or ASLF maintain that any penalty is due under this section, defendant may present any defense available under the Clean Water Act and applicable regulations. It shall also be an affirmative defense to a claim for a penalty due under this section that the violation resulted from the work set forth in Part III of Appendix A.

f. If any work set forth in Part III of Appendix A results in a violation of interim limits, defendant shall promptly notify DEC and ASLF of the violation and document the apparent cause of the violation.

5. The terms and conditions of Appendix A of this order may be delayed or modified if the defendant or its consultant, contractor or agent cannot comply with the terms of this order because of an act of God, war, strike or other condition as to which conduct on the part of the defendant or its consultant, contractor or agent was not the proximate cause; provided, however, that the defendant immediately notifies the plaintiffs in writing when it obtains knowledge of any such condition and requests an appropriate extension or modification of the provisions hereof.

6. Defendant shall pay a penalty of $875,000 for its violations of the ECL. That penalty shall be fully suspended on condition that defendants comply with the terms of Appendix A. Once the work set forth in Appendix A is completed and approved by DEC, and DEC advises the defendant that the work is satisfactorily completed, the $875,000 suspended penalty shall be extinguished.

7. The defendant shall not allow any sewer connections or extensions, or any other connection with a design or actual flow in excess of 5,000 gpd, where such connections or extensions could in any area such as the Ley Creek or Liverpool Service areas cause increased discharge of raw sewage. Increases in actual flow in excess of 5,000 gpd may be permitted, provided adequate mitigation measures are provided for and approved by DEC which protect against any increase in raw sewage.

8. Defendant shall submit a Draft Environmental Impact Statement with the Municipal Compliance Plan required in Appendix A which shall be subject to the provisions of SEQRA. Furthermore, the parties agree that DEC will be the "lead agency" in reviewing this application and DEC shall issue a positive declaration for the project pursuant to 6 NYCRR 617.6. Defendants agree that the last report must be consistent with the form of the Draft Environmental Impact Statement to be submitted pursuant to 6 NYCRR 617.8 and review shall proceed in accordance with 6 NYCRR 617.8 and 617.9. Finally, all the parties agree that a hearing on the application shall be held pursuant to 6

NYCRR 617.8(d). Defendants agree not to contest the positive declaration or agreement to hold a hearing in this case.

9. All reports and other documents which the defendant is required to submit to DEC pursuant to this judgment, Appendix A or the defendant's SPDES permit, shall be submitted to DEC's Regional office in Syracuse, to the attention of the Regional Water Engineer; in triplicate.

10. Plaintiffs State of New York and ASLF reserve the right, jointly and separately, to move the Court for enforcement of the terms of this order, including any provision requiring the payment of stipulated penalties, consistent with the provisions of paragraph 12 hereto.

11. Plaintiff ASLF and defendants, Onondaga County Department of Drainage and Sanitation and Onondaga County each reserve any rights they may have to seek, contest or compromise any claim ASLF may have for attorneys fees and expenses in this case.

12. This judgment shall apply to, and be binding upon the parties, their officers, agents, servants, employees, successors baand assigns, and each of them, and upon all persons, firms and corporations acting under, through, for or in active concert or participation with the parties or any of them.

13. This Court retains jurisdiction of the subject matter of this action for the purposes of enforcing the terms of this judgment.

14. If any penalty becomes due under this judgment, plaintiffs may move for judgment upon 30 days written notice to the defendants. Any other applications by the plaintiffs for

enforcement of this judgment or for sanctions for non-compliance other than those specifically provided herein, including applications to cite defendants for contempt of court, shall be made directly to this Court upon thirty days' notice to defendant.

Dated:

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SO ORDERED: 1/21/89

Thomas J. McAvoy
U.S.D.J.

ASLF AND STATE OF NEW YORK v. ONONDAGA COUNTY
88-CV-0066 (NDNY)
COMPLIANCE SCHEDULE

APPENDIX A

Milestone Dates

I. INTERIM EFFLUENT LIMITS

The defendant shall be bound by the interim limits and monitoring requirements at Metro as defined in Appendix B.

II. LEY CREEK PUMP STATION AND LIVERPOOL PUMP STATION IMPROVEMENTS

The defendant shall construct these facilities pursuant to the following schedules:

Ley Creek P.S. and S.A.

March 16, 1989	Receive bids
April 30, 1989	Award construction contracts
May 15, 1989	Issue notices to proceed
November 15, 1991	Initiate operation/substantially complete construction
November 16, 1992	Project performance certification

Liverpool P.S.

March 24, 1989	Receive bids
May 8, 1989	Award construction contracts
May 20, 1989	Issue notices to proceed
May 20, 1991	Initiate operation/substantially complete construction
May 20, 1992	Project performance certification

III. PERFORMANCE EVALUATION/PHOSPHORUS REMOVAL PROGRAM

June 1, 1989	The defendant shall undertake a comprehensive performance evaluation of the operations at the Metropolitan Syracuse Treatment Plant, and submit a report to DEC summarizing this evaluation by this date. This

evaluation and report shall include, but not be limited to:

a) flow analysis
b) systematic unit process evaluation
c) all unit processes - operation, maintenance and maximization of efficiency
d) overall plant performance
e) operational strategies for periods of excessively high flows

A part of the unit process evaluations shall include, but not be limited to:

a) maximizing the effectiveness of the tertiary settling tanks;
b) improving performance of the secondary clarifiers, including weir leveling, corner sweeps, wind screens, baffling, and flow distribution;
c) an evaluation of various methods of phosphorus removal capable of achieving an effluent phosphorus concentration of less than 1.0 mg/l. Anticipated effects of these removal methods on other unit processes shall be considered.

Also due by this date will be a submittal of a proposed workplan that shall include an application and testing schedule which shall be concluded by April 1, 1991.

The report shall include specific recommendations for maximizing overall plant efficiency, and will specify items immediately implementable, and those requiring capital intensive improvements. After review by the DEC a schedule of implementation will be developed and become an enforceable part of this order. Implementations of elements concerning effluent limits which are model dependent will be deferred until model completion.

August 1, 1988 The defendant has begun and shall

	continue a phosphorus removal program to investigate the use of chemical addition to achieve an effluent phosphorus concentration of less than 1.0 mg/l. The initial phase will consist of the current use of ferrous sulfate. The following information will be collected during the testing program and is to be submitted monthly with the operating report for Metro: 1) concentration of ferrous sulfate or other additives 2) dosage rate 3) application point(s) 4) influent and effluent phosphorus levels 5) amounts of primary, secondary and tertiary sludge produced 6) anaerobic digester efficiency calculations
November 1, 1988	Submit report to DEC setting forth the results of a literature search and case studies regarding phosphorus removal.
June 1, 1989	Defendant shall submit a report summarizing the initial phases of the phosphorus removal period (ferrous sulfate). All information submitted on a monthly basis shall be summarized in this report, with recommendations on effectiveness for further use included. The defendant will use the results of the June 1, 1989 plan evaluation report, and the proposed workplan to investigate other precipitants for phosphorus removal. Examples would be the use of ferric chloride and alum, with and without polymers, and ferrous sulfate with polymer. Monthly status reports on the program will be submitted with Metro operating reports, and summary reports, similar to June 1, 1989 due date report, will be submitted at six month intervals.
April 1, 1991	Conclude phosphorus removal testing

program. Submit a letter to NYSDEC to this effect.

May 1, 1991

Submit a report summarizing all aspects of the phosphorus removal testing program. All data submitted on a monthly basis and six month basis is to be summarized in this report, with recommendations for a permanent treatment system included.

IV. ONONDAGA LAKE STUDY/MANAGEMENT ALTERNATIVES

The defendant shall work with the DEC and Central New York Regional Planning and Development Board (CNYRPDB) in their efforts to complete the Onondaga Lake modeling effort now being performed by the Upstate Freshwater Institute (UFI). This effort is being undertaken so that various engineering alternatives for upgrading and/or diverting the Metro discharge, and treating and/or diverting the combined sewer overflows (CSO's) can be evaluated regarding their effectiveness in cleaning Onondaga Lake and its tributaries. This cooperation from the defendant shall be of the following form:

a) Review jointly with the DEC and CNYRPDB and ASLF the modeling program work plan, data, process kinetics and outputs.

b) The defendant shall make the following payments to a consultant acceptable to the DEC.

	AMOUNT
October 14, 1988	$ 50,000
January 1, 1989	$125,000
April 1, 1989	$175,000
April 1, 1990	$175,000

October 1, 1988

c) Defendant shall submit to the DEC an approvable workplan, designed by acceptable outside engineering consultants and aimed at establishing the engineering performance characteristics of engineering alternatives that could be used to upgrade and/or divert Metro discharge flows and treat and/or divert the CSO's.

Engineering alternatives to be evaluated shall include but not limited to:

(1) Ammonia removal at Metro

(2) Phosphorus removal at Metro

(3) Diversion of the Metro discharge to the Seneca River

(4) Swirl concentrator treatment for CSO's provided at central locations with interceptors running up Harbor Brook and Onondaga Creek.

a. Discharge to Lake
b. Discharge to Seneca River

(5) FBM systems located at the mouth of each creek with interceptors running up Harbor Brook and Onondaga Creek.

a. Discharge to Lake
b. Discharge to Seneca River

(6) Swirl concentrators located at several points discharging to their respective streams.

d) Upon approval of the workplan by DEC, the defendant shall begin work on the study effort of engineering alternatives. Quarterly progress reports shall be submitted by defendants to DEC.

September 1, 1990

e) The defendant shall submit the final study report of engineering alternatives. Engineering information in this report shall be in the form that is compatible with the CNYRPDB model of Onondaga Lake.

f) The defendant shall work with the DEC to use the CNYRPDB model to evaluate the effect that each management alternative has on the lake and its tributaries. No later than ninety (90) days after the

model evaluation is completed, the defendant shall submit a Municipal Compliance Plan (MCP) that will include implementation of the selected alternative(s). The MCP must discuss, among other things, the impacts of the inflow from the foundation drains. Upon approval by the DEC, the implementation schedule contained in the MCP to achieve final effluent limitations will become an enforceable part of this judgment.

V. EXTRANEOUS FLOW ABATEMENT PROGRAM

The defendant acknowledges the extraneous flow from downspouts, sump pumps and footing drains may have an adverse impact on the defendant's ability to comply with applicable Federal and State clean water laws. As such, the defendant agrees to undertake a program that will result in a reduction of extraneous flow through commencement of an ongoing and vigorous enforcement program against violators which shall include, consistent with all pertinent statutes, laws, rules and regulations:

- proceedings to conduct hearings relative to alleged violations
- hearings to establish violations
- fines and injunctions where violations are established and no corrective action has been taken.

January 1, 1989 thru April 1, 1989

1. Defendant shall initiate a public information program consisting of information hearings, press releases, meetings with appropriate governing bodies, property owners

and organizations. The public shall be informed that the defendant requires disconnection of all improperly connected downspouts and sump pumps. The public shall also be informed that the failure to disconnect may result in the need

to construct a larger sewage treatment plant at a greater cost.

March 1, 1989

2. Defendant shall submit an approvable plan to DEC whereby the County shall undertake a program in which the County shall certify that at the time of the transfer of title, the subject property does not have any roof leader or sump pump connections to the sanitary system. As to all new construction, the County shall certify that at the time of transfer of title, the subject property is in full compliance with the County sewer use ordinance and the sanitary code.

   This "Certification program" plan must be accompanied by any necessary enabling or implementing legislation. After approval of the plan by DEC, the defendant shall enact a local law implementing the approved plan no later than May 1, 1989.

March 1, 1989

3. Defendant shall submit for approval a survey design to DEC properties to determine location and magnitude of improperly connected sump pumps and footing drains. The survey shall provide for inspection of a stratified random sample of all properties in specified categories. The categories of property to be sampled shall include, but not be limited to, single family residential, non-single family residential, commercial, industrial, and public properties.

April 15, 1989

4. Defendant shall commence a property to property survey to identify all

		improperly connected downspouts within the separate sanitary sewered areas of the Plant Service Area.
April 15, 1989 thru August 15, 1989	5.	Defendant shall commence the approved survey of properties to identify and determine location and magnitude of improperly connected sump pumps and footing drains.
June 1, 1989	6.	Defendant shall commence implementation of the Certification Program.
October 15, 1989	7.	Defendant shall submit to the NYSDEC a report on the results of the aforementioned surveys.
October 15, 1989	8.	Defendant shall require disconnection from the sanitary sewer all downspouts and sump pump connections.
February 15, 1990	9.	Defendant shall confirm that the properties previously identified as out of compliance have disconnected sump pumps and/or roof leaders from the sanitary system. Defendant shall also commence a new survey of a stratified, random sample of all of the previously surveyed categories of properties to determine overall compliance with the directive to disconnect.
April 15, 1990	10.	By this date defendant shall initiate legal actions against property owners that were found to be in non-compliance with the disconnection directive.

APPENDIX B

INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the Period Beginning On The Effective Date of This Order

and lasting until Achievement of Final Effluent Limits

the discharges from this facility shall be limited and monitored by the Defendant as specified below:

TABLE 1

Outfall Number	Effluent Limitations (Maximum Limits except where otherwise indicated)			
001	(X) Flow	30 day arithmetic mean	80.0	(X) MGD ( ) GPD
	(X) CBOD5	30 day arithmetic mean	21.0 mg/l and	14011 lbs/day(*1)
	(X) CBOD5	7 day arithmetic mean	31.5 mg/l and	21017 lbs/day
	( ) CBOD5	Daily	____ mg/l and	____ lbs/day
	( ) UOD (*2)	Daily	____ mg/l and	____ lbs/day
	(X) Suspended Solids	30 day arithmetic mean	30 mg/l and	20016 lbs/day(*1)
	(X) Suspended Solids	7 day arithmetic mean	45 mg/l and	30024 lbs/day
	( ) Suspended Solids	Daily	____ mg/l and	____ lbs/day

(X) Effluent disinfection required: ( ) all year

(X) Seasonal from April 1 to October 15

(X) Fecal Coliform 30 day geometric mean shall not exceed 200/100 ml (5)

(X) Fecal Coliform 7 day geometric mean shall not exceed 400/100 ml (5)

( ) Fecal Coliform 6 hour geometric mean shall not exceed 800/100 ml (*3)

( ) Fecal Coliform No individual sample may exceed 2400/100 ml (*3)

If chlorine is used for disinfection, a chlorine residual of 0.5-2.0 mg/l shall be maintained in the chlorine contact chamber whenever disinfection is required. If specified here, the chlorine residual in the final discharge shall not exceed ____ mg/l.

( ) Total Coliform	Daily	____/100 ml
( ) Total Kjeldahl Nitrogen	Daily	____/mg/l as N
( ) Ammonia	Daily	____/mg/l as NH_3
( ) Dissolved Oxygen	Minimum	greater than ____ mg/l
(X) pH	Range	6.0 to 9.0
(X) Settleable Solids	Daily	0.3 ml/l
(X) Phosphorus	~~Daily~~ 30-day av.	1.0 mg/l as P
( ) Total Nitrogen	Daily	____ mg/l as N
(X) Cyanide	Daily	7.2 lbs/day

CONTINUED OF REVERSE SIDE

APPENDIX B

TABLE 2

Monitoring Requirements

Parameter	Frequency	Sample Type	Sample Location Influent	Effluent	
☒ Total Flow, MGD	Continuous	N/A	X		
☒ CBOD$_5$, mg/l	1/day	24 hr. comp.	X	X	
☒ Suspended Solids, mg/l	1/day	24 hr. comp.	X	X	
☒ Fecal Coliform, No./100 ml	1/day	Grab		X	(5)
☐ Total Coliform, No./100 ml					
☒ Total Kjeldahl Nitrogen, mg/l as N	2/week	24 hr. comp.	X	X	
☒ Ammonia, mg/l as NH$_3$	1/day	24 hr. comp.	X	X	
☐ Dissolved Oxygen, mg/l					
☒ pH	6/day	Grab		X	
☒ Settleable Solids, ml/l	6/day	Grab	X	X	
☒ Residual Chlorine, mg/l	5/day	Grab		X	(*4)
☒ Phosphorus, mg/l as P	1/day	24 hr. comp.		X	
☒ Temperature, °C	6/day	Grab		X	
☐ Total Nitrogen, mg/l as N					
☒ Cyanide	1/month	Grab (7)		X	
☒ Total Dissolved Solids	2/week	24 hr. comp.	X	X	

NOTE: (*1) and effluent values shall not exceed 15 % of influent values.
(*2) (Ultimate Oxygen Demand) shall be computed and reported as follows:
UOD = 1 1/2 x CBOD$_5$ + 4 1/2 x TKN (Total Kjeldahl Nitrogen).
(*3) applicable only in the Interstate Sanitation District.
(*4) sample contact chamber effluent and final effluent if limits are specified for both.

Note: Percent removal requirements do no apply during periods of wet weather.

(5) Effective from April 1 to October 15
(6) This is monthly average limitation. The 001 outfall shall be used exclusively for all discharges up to 120 MGD from the facility.
(7) Composite of three grab samples, one every eight hours.

COMBINED SEWER OVERFLOW PROBLEMS FOR SMALL COMMUNITIES

Testimony

The Honorable Marcy Kaptur

March 22, 1990

Thank you, Mr. Chairman and (Committee Members present) for the opportunity to testify before you today. I would like to discuss, Mr. Chairman, the difficulty small communities have in implementing solutions to the combined sewer overflow problem as well as obtaining funding for controls.

Storm drainage is an increasingly recognized source of water pollution. The EPA has concluded that rainwater in varying degrees always is polluted by contact with roads contaminated with oil, rubber and lead from cars, as well as other pollutants such as toxic organics containing lawn and agricultural pesticides. This non-point pollution needs to be controlled in an effective way which does not cause financial problems for small communities.

The initiation of State Water Pollution Control Revolving Funds or loan programs poses problems for small communities that do not have the financial resources to effectively repay the loans.

For the last few years, the village of Delta in my district has been constructing a wastewater treatment plant that was partially funded through an EPA state grant. Included in the pollution discharge permit and the grant for the wastewater treatment plant are stipulations that the Village must correct the combined sewer overflow problem which exists in the Village. Generally, wastewater treatment was not available at the time of installation of these combined systems.

The Village consists of twelve combined sewer overflows and Ohio EPA and U.S. EPA have instructed the Village to eliminate at least one of those twelve. EPA required that this overflow be eliminated as part of the wastewater treatment plant grant. At the time that grant was awarded, the Village inquired as to how it should finance this part of the project; the Village was given no indication as to how to fund the CSO.

The Village undertook a study of the contributing sewers to this particular overflow and determined that it would not be possible to just separate the storm water from the combined sewer overflow because there are too many sanitary lines running into the stormwater lines throughout the Village. The study of the combined sewer overflow is being done as part of the grant condition and is to be submitted to Ohio EPA by April 30th.

A second alternative and the most viable solution as determined by the Village's Chief Engineer is to build a pond or lagoon which will collect the overflow and then pump the overflow at a controlled rate to the wastewater treatment plant. Similar systems were initiated in Philadelphia and Providence. It is also the Chief Engineer's opinion that this method is the most cost effective way to deal with this critical problem. The Village of Delta would need to spend an additional $500,000 to implement the plan. This amount is in addition to approximately $1.2 million the Village has already spent on its sewage system. With the phaseout of the federal government's grants program, the only assistance available to local communities is through the states' loan fund.

The Village's share of the cost of the wastewater treatment plant is $1.15 million. For this project, sewer usage rates were raised 85% to help fund the Village's portion of the cost. The average monthly combined water and sewer bill for Delta residents is approximately $38. If rates are raised to finance the combined sewer overflow problem, the average monthly bill will rise to about $58. Rates for the Village of Delta are at their peak and much resistance will be felt if rates are increased again. According to EPA, in some areas of the country, sewer and water rates may rise as much as 300% due to the new loan program.

Delta's situation is just one example of the problems small communities have paying for combined sewer overflows. Delta has made several efforts to relieve and correct its CSO problem. Delta is a village of only 3,000 people and does not have the resources to combat this problem on its own without raising sewer usage rates to very high levels.

Funding needs for wastewater treatment plant construction nationwide remains high with an estimate from EPA of $83 billion. How can we expect our smaller communities to bear the brunt of that cost?

It is my understanding that Geline Williams, the Mayor of Richmond and Chairman of the CSO Partnership, testified yesterday on how to deal with controlling combined sewer overflows in a cost effective manner. The Partnership's proposal stresses the site-specific nature of CSO's and the need for flexibility in the implementation of CSO controls. Several factors play a part in dealing with controlling combined sewer overflows. Among those are population size and density, topography, geology, land use, geography, climate, system design, sanitary flow characteristics, and receiving waters.

Federal and state grant funding is necessary to ensure the implementation of effective combined sewer overflow controls. The cost of even repaying the loans exceeds the capability of our smaller communities.

I support the CSO Partnership whereby a partnership is established between federal, state and local governments where local governments contribute to CSO controls to the extent of their financial ability. Federal and state governments would provide the remainder of the money needed to complete the work.

The Partnership has indicated that legislation is being prepared which will provide for federal grant funding on the basis of financial need and water quality benefit. The intent of the legislation is also to provide a separate regulatory program for combined sewer overflows in order to address their site-specific nature.

I hope that you will consider these proposals as the Committee reauthorizes the Federal Water Pollution Control Act while keeping in mind the concerns of our local communities. Thank you, Mr. Chairman, for the opportunity to appear.

TESTIMONY OF

WILLIAM KRICHBAUM, DIRECTOR OF REGION 7
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES

OF THE

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

MARCH 22, 1990

WASHINGTON, D.C.

GOOD AFTERNOON. MY NAME IS WILLIAM KRICHBAUM AND I AM THE DIRECTOR OF THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC) REGION 7 WHICH INCLUDES THE CENTRAL PART OF UPSTATE NEW YORK AND, NOTABLY, ONONDAGA LAKE. I AM PLEASED TO APPEAR TODAY ON BEHALF OF THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION TO GIVE OUR PERSPECTIVE ON THE RESTORATION OF ONONDAGA LAKE. I WANT FIRST TO THANK YOU, MR. CHAIRMAN, FOR THIS OPPORTUNITY. I ALSO WANT TO THANK YOUR COLLEAGUE CONGRESSMAN JAMES WALSH WHO REPRESENTS THE SYRACUSE/ONONDAGA LAKE DISTRICT IN THIS HOUSE. WE APPRECIATE CONGRESS' EFFORTS TO ADDRESS THIS ENVIRONMENTAL CHALLENGE.

LAST FALL CONGRESS APPROPRIATED $500,000 UNDER THE CLEAN LAKES PROGRAM FOR THE ONONDAGA LAKE MANAGEMENT CONFERENCE. DEC HAS APPLIED FOR THIS GRANT MONEY. COMMISSIONER JORLING HAS ALREADY TESTIFIED IN SUPPORT OF S 2183 -- THE 1990 WATER RESOURCES BILL WHICH CONTAINS AUTHORIZATION LANGUAGE FOR THE CONFERENCE. YOUR ATTENTION TO THIS ENVIRONMENTAL PROBLEM WILL GREATLY BENEFIT CENTRAL NEW YORK.

CONFERENCE ACTIVITIES ARE ALREADY UNDERWAY. GOVERNOR CUOMO, COMMISSIONER JORLING, CONGRESSMAN WALSH, SENATOR MOYNIHAN, THE MAYOR OF SYRACUSE, THE ONONDAGA COUNTY EXECUTIVE, AND REPRESENTATIVES OF OUR STATE ATTORNEY GENERAL, THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND U.S.
ARMY CORPS OF ENGINEERS ATTENDED THE FIRST MEETING OF THE ONONDAGA LAKE MANAGEMENT CONFERENCE ON FEBRUARY 14, 1990.

THIS IMPRESSIVE GATHERING IS AN INDICATION OF THE HIGH HOPES THE PEOPLE AND THEIR REPRESENTATIVES HAVE FOR THIS LEGISLATION. I RECENTLY ATTENDED THE SECOND MEETING OF THE ONONDAGA LAKE MANAGEMENT CONFERENCE, SO THE CONFERENCE IS GEARING UP FOR ITS ENORMOUS TASK.

ONONDAGA LAKE HAS BECOME A SYMBOL OF ENVIRONMENTAL ABUSE. IT EARNED THIS DUBIOUS DISTINCTION AS A RESULT OF A CENTURY OF MISUSE BY LOCAL INDUSTRIES AND NEGLECT BY GOVERNMENT. THE CITY OF SYRACUSE AND A HEAVILY INDUSTRIALIZED SUBURBAN AREA ARE DIRECTLY ADJACENT TO ONONDAGA LAKE. ASIDE FROM THE LAKE'S CONVENIENCE AS A RECEPTACLE FOR DISCHARGES OF INDUSTRIAL AND MUNICIPAL WASTE, THE LAKE'S SHALLOWNESS AND ITS LARGE WATERSHED MAKE IT ESPECIALLY SENSITIVE TO POLLUTION. IT RECEIVES URBAN AND AGRICULTURAL RUNOFF FROM 270 SQUARE MILES. DESPITE SPENDING SEVERAL HUNDRED MILLION FEDERAL, STATE AND LOCAL DOLLARS ON WATER POLLUTION CONTROL PROJECTS, INCLUDING A MAJOR MUNICIPAL SEWAGE TREATMENT FACILITY BUILT IN THE EARLY 1970'S, AND INITIATING NUMEROUS ENFORCEMENT ACTIONS AGAINST POLLUTERS, MUCH REMAINS TO BE DONE TO RECLAIM WHAT CAN BE AN ENORMOUSLY VALUABLE COMMUNITY RESOURCE.

I WANT TO BRIEFLY OUTLINE SOME OF THE ACTIONS WHICH HAVE BEEN UNDERTAKEN IN THE PAST AND WHICH ARE CURRENTLY

UNDERWAY REGARDING THE RECLAIMING OF ONONDAGA LAKE. SEVERAL DEVELOPMENTS OVER THE LAST TWO DECADES HAVE RESULTED IN MEASURABLE IMPROVEMENTS IN THE WATER QUALITY OF THE LAKE. IN THE MAIN, THESE IMPROVEMENTS CAN BE ATTRIBUTED TO UPGRADING THE SYRACUSE METROPOLITAN TREATMENT PLANT, IMPLEMENTING OF FEDERALLY REQUIRED INDUSTRIAL DISCHARGE CONTROLS THROUGH THE STATE POLLUTION DISCHARGE ELIMINATION SYSTEM AND ALLIED CHEMICAL COMPANY'S CLOSING OF ITS NEARBY MANUFACTURING FACILITY IN 1986. IMPROVED WATER QUALITY HAS CONTRIBUTED TO AN EXPLOSION OF INTEREST IN ONONDAGA LAKE RESTORATION WITHIN THE LAST THREE YEARS. THE PUBLIC, AS WELL AS GOVERNMENT AT ALL LEVELS, HAVE RECOGNIZED THE POTENTIAL OF THIS LAKE. A MAJOR PRIVATE REDEVELOPMENT PROJECT ON THE LAKEFRONT HAS PROVIDED ADDITIONAL IMPETUS FOR THE CLEANUP. THE POTENTIAL FOR A BILLION DOLLAR MULTI-USE AREA WITH THE LAKE AS A FOCAL POINT HAS SILENCED SKEPTICS WHO THOUGHT THAT ONONDAGA LAKE WAS A LOST CAUSE. THERE IS MUCH EXCITEMENT OVER THE RECREATIONAL, COMMERCIAL, CULTURAL AND RESIDENTIAL PLANS FOR THE AREA. THIS OPTIMISM IS BASED ON THE SHARED BELIEF THAT WE CAN CLEAN UP THIS LAKE.

OVER THE LAST SEVERAL YEARS, ONONDAGA LAKE RESTORATION HAS BECOME A MAJOR ENVIRONMENTAL PRIORITY FOR THE STATE OF NEW YORK. WE HAVE TAKEN ACTION TO COMPEL INVESTIGATION AND REMEDIATION OF HAZARDOUS WASTE SITES AND OTHER CHEMICAL

CONTAMINATION IN OR NEAR THE LAKE AND HAVE PURSUED RESPONSIBLE PARTIES IN THIS EFFORT. THE STATE HAS EXECUTED A NATIONAL MUNICIPAL POLICY SETTLEMENT TO UPGRADE THE AREA'S SEWAGE FACILITIES AND TO ABATE COMBINED SEWER OVERFLOWS. WE ARE ALSO PARTICIPATING IN MAJOR WATER QUALITY SAMPLING STUDIES TO GATHER THE DATA NEEDED TO MORE FULLY UNDERSTAND THE LAKE AND TO PLAN FOR REMEDIAL ACTIVITIES.

LAST YEAR DEC DRAFTED AN "ONONDAGA LAKE STRATEGY" WHICH PROVIDES A FRAMEWORK FOR ACTIVITIES TO BE UNDERTAKEN DURING THE NEXT FIVE YEARS. WE ANTICIPATE THAT THE STRATEGY WILL BE REFINED AND EXPANDED UPON BY FORTHCOMING EFFORTS, INCLUDING THE ONONDAGA LAKE MANAGEMENT CONFERENCE.

THOUGH WE HAVE MADE HEADWAY, I MUST EMPHASIZE THAT MUCH REMAINS TO BE DONE. SWIMMING IS NOT PERMITTED BECAUSE OF POOR TRANSPARENCY AND HIGH BACTERIA LEVELS. THE FISHERY IS IMPACTED BY CHLORIDES, MERCURY CONTAMINATION OF FISH FLESH, INADEQUATE DISSOLVED OXYGEN, HIGH AMMONIA LEVELS AND A DAMAGED HABITAT. THE LARGEST TRIBUTARY TO THE LAKE FLOWS THROUGH THE CITY OF SYRACUSE. THAT STREAM CARRIES LARGE QUANTITIES OF BACTERIA AND TURBIDITY FROM URBAN RUNOFF AND COMBINED SEWER OVERFLOWS.

ONE OF THE MOST CHALLENGING PROBLEMS EXHIBITED BY THE LAKE IS THE CONDITION OF THE LAKE BOTTOM. THE SEDIMENTS ARE LISTED ON THE REGISTRY OF INACTIVE WASTE SITES. DEC HAS COLLECTED EXTENSIVE SEDIMENT CORE DATA WHICH WILL ASSIST IN FORMULATING A REMEDIAL PLAN. THE LAKE BOTTOM IS ALSO COATED WITH CALCITE. THIS CALCIUM CARBONATE DEPOSITION RESULTED FROM A COMBINATION OF THE LAKE'S NATURAL CHEMISTRY WITH CALCIUM LOADINGS FROM THE ALLIED CHEMICAL WASTEBEDS ADJACENT TO THE LAKE. CLOSURE OF THE ALLIED FACILITY GREATLY REDUCED THIS INPUT BUT SOME LEACHING FROM THE BEDS CONTINUES AND THE HISTORIC DAMAGE PROVIDES A HOSTILE ENVIRONMENT FOR AQUATIC LIFE. THE LOWER REACHES OF THE LAKE ARE CURRENTLY NON-PRODUCTIVE.

IN ADDITON TO THESE IN-LAKE ENVIRONMENTAL PROBLEMS, THERE ARE MYRIAD OTHER PROBLEM SITES NEAR THE LAKE WHICH MAY IMPACT EXISTING AND FUTURE USE OF THE RESOURCE.

THE PROBLEMS OF ONONDAGA LAKE ARE UNIQUE AND THEY ARE SERIOUS. IN SOME WAYS THE SOLUTIONS WILL CHALLENGE THE LIMITS OF EXISTING TECHNOLOGY. THIS LAKE CAN SERVE AS A SYMBOL OF WHAT GOVERNMENT CAN ACCOMPLISH WHEN IT COMMITS ITS RESOURCES TO AN ENVIRONMENTAL CHALLENGE. I URGE YOU TO SUPPORT THE ONONDAGA LAKE MANAGEMENT CONFERENCE AND I PLEDGE THE BEST EFFORTS OF OUR DEPARTMENT TO WORK WITH FEDERAL

Congressman Bill Lowery's

Testimony
before the

Public Works and Transportation Committee
Subcommittee on Water Resources

Chairman Henry Nowak

March 22, 1990

Mr. Chairman, I appreciate the opportunity to appear before this panel today with my colleague from Massachusetts Congressman Markey. We serve as co-chairmen of the Congressional Caucus for Clean Water.

I concur with my colleague that the burden must be shared. Burden sharing is a current buzzword in Washington. We want our allies to share the burden of defense, our old foes want to become new allies and would like us to share in the burden of creating democracies.

But here at home we have a failing infrastructure and polluted air and water that also demand burdensharing.

The Federal government has not shied away from sharing this task in the past. Since 1972, EPA has provided more than $45 billion in construction grants nationwide--in some instances covering up to 75 percent of the costs.

Support exists for federal financial involvement in these programs. The Caucus for Clean Water had more than 80 people sign a letter to Budget Committee Chairman Panetta urging full funding for the $2.4 billion authorized for the Revolving Loan Fund.

Everyone seems to be fully cognizant of the dangers to our environment and more and more Americans are willing to cooperate to save the quality of life so important to us all.

President Bush has called for a program entitled, "America the Beautiful" in which he wants to plant a billion trees. Do we water those billion trees from sewage-tainted water sources?

We keep legislating our fears by requiring more and more stringent guidelines to achieve clean air and water, yet we are abandoning our commitment to the financial burden of those guidelines.

Cleaning America is going to be an ongoing challenge but one we must share. States and communities faced with declining dollars from Washington, are ill prepared to meet millions of dollars in demands for advanced treatment systems. As Congressman Markey has made clear, the EPA Needs Survey indicated the costs to states and localities to comply with these Federal mandates are prohibitive.

Mr. Chairman, the states and local communities want clean water as much as the Congress, and they intend to do everything in their power to achieve the goals set for them. But they need help. The Federal government needs to seriously assess it's future role and financial commitment to these programs.

STATEMENT OF THE HONORABLE EDWARD J. MARKEY

Subcommittee on Water Resources
March 22, 1990

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, REPRESENTATIVE LOWERY AND I APPRECIATE THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY TO DISCUSS THE REAUTHORIZATION OF THE FEDERAL WATER POLLUTION CONTROL ACT. WE ARE HERE AS THE CO-CHAIRMEN OF THE CONGRESSIONAL CAUCUS FOR CLEAN WATER -- A GROUP OF 47 MEMBERS OF CONGRESS CONCERNED ABOUT WATER QUALITY ISSUES. WE ARE HAPPY TO COUNT AMONG OUR MEMBERS SIX MEMBERS OF THIS SUBCOMMITTEE, INCLUDING THE CHAIRMAN. OUR COMMON CAUSE IS TO ENSURE THAT THE FEDERAL GOVERNMENT FOLLOW THROUGH ON ITS RESPONSIBILITY TO THE STATES, CITIES AND TOWNS AS THEY STRUGGLE TO MEET OUR NATION'S CLEAN WATER COMMITMENTS.

IN 1988, WHEN ASKED IF THE QUALITY OF THE ENVIRONMENT WAS BETTER OR WORSE THAN FIVE YEARS PREVIOUSLY, MORE PEOPLE SAID THAT IT WAS GETTING WORSE. THIS WAS THE FIRST TIME THAT THIS NEGATIVE VIEW PREVAILED SINCE THE 1970s, AND IN 1989 THE RESPONSE WAS THE SAME. AMERICANS ARE BECOMING CONVINCED THAT THE THREAT OF ENVIRONMENTAL DECLINE IS AS DANGEROUS AS ANY OTHER THREAT WE FACE. THE 1990s PROMISES TO BE THE DECADE OF THE ENVIRONMENT AS MORE PEOPLE BECOME AWARE OF OUR WORLD'S PRECARIOUS STATE AND COMMIT THEMSELVES TO WORKING TO MAKE IT BETTER.

IN CONGRESS WE FOCUS THIS YEAR ON THE CLEAN AIR ACT WITH THE GOAL OF SLOWING THE HARM WE HAVE BROUGHT TO THE AIR WE BREATH. IN

FOCUSING ON CLEAN AIR, HOWEVER, I HOPE WE DO NOT LOSE SIGHT OF THE COMMITMENT WE MADE TO CLEAN WATER IN PASSING THE 1987 CLEAN WATER ACT.

IN 1987, WE OVERRODE PRESIDENT REAGAN'S VETO OF THE WATER QUALITY ACT BECAUSE WE RECOGNIZED THE ENORMOUS NEED FOR ACTION ON CLEAN WATER. AT THAT TIME, WE SET SPECIFIC AND COMPREHENSIVE STANDARDS, GOALS AND REQUIREMENTS FOR STATES TO FOLLOW.

TWO YEARS AGO, THE EPA PREPARED THE 1988 NEEDS SURVEY REPORT, WHICH DETAILED THE CAPITAL COSTS NEEDED TO BUILD THE PUBLICLY OWNED MUNICIPAL WASTEWATER TREATMENT FACILITIES REQUIRED BY THE CLEAN WATER ACT. ACCORDING TO THIS REPORT, $83.5 BILLION IS REQUIRED TO SATISFY ALL CATEGORIES OF NEED IN THE ACT. AS THE MEMBERS OF THE SUBCOMMITTEE KNOW, WASTEWATER TREATMENT PROBLEMS ARE NOT UNIQUE TO PARTICULAR STATES OR TO METROPOLITAN AREAS. THE NEED IN EACH OF 22 STATES EXCEEDS $1 BILLION. NEW YORK, FOR EXAMPLE, FACES OVER $12 BILLION TO COMPLY, WHILE FLORIDA, CALIFORNIA AND MY OWN STATE OF MASSACHUSETTS REQUIRE OVER $5 BILLION EACH. VERY FEW STATES ARE SPARED; IN ALL BUT FOUR THE NEED IS GREATER THAN $100 MILLION.

IF THE FEDERAL GOVERNMENT BAILS OUT, AS IS HAPPENING IN SO MANY AREAS, STATE AND LOCAL GOVERNMENTS WILL HAVE TO SWALLOW A POISONOUS CONCOCTION OF INCREASED TAXES AND RATE SHOCK IF THEY ARE TO AVOID NONCOMPLIANCE. IN TOO MANY CASES, THEY MAY JUST REFUSE TO SWALLOW IT AT ALL BY SIMPLY NOT COMPLYING WITH THOSE

FEDERALLY-IMPOSED ENVIRONMENTAL REQUIREMENTS. IT IS HYPOCRITICAL FOR THE FEDERAL GOVERNMENT TO IMPOSE FEDERAL DEMANDS BUT PROVIDE NO FEDERAL DOLLARS TO MEET THE IMPOSED REQUIREMENTS. WE MUST AT LEAST BE PREPARED TO SHARE THE BURDEN WE HAVE PLACED ON THE STATES.

I WOULD NOW LIKE TO TURN THE MICROPHONE OVER TO THE CO-CHAIR OF THE CLEAN WATER CAUCUS, BILL LOWERY, TO COMPLETE OUR TESTIMONY ON THIS ISSUE.

Testimony on the New Clean Water Act
by Susan Murcott, Research Assistant, Massachusetts Institute of Technology and
Donald R.F. Harleman, Ford Professor of Engineering, Massachusetts Institute of Technology
given at a Hearing of the United States House of Representatives
Water Resources Subcommittee, Rayburn Building, Washington, D.C.
Thursday, March 22, 1990

My name is Susan Murcott. I am a research assistant at MIT working under Prof. Donald Harleman, Ford Professor of Engineering. I am one of a team of people developing new chemical wastewater treatment technologies for publicly owned treatment facilities. My testimony today on the need for statutory support for new and innovative wastewater treatment technologies represents the views of Prof. Harleman, who is unable to be present, myself, and other members of the MIT team.

This testimony makes three key points:

1. It details how the Clean Water Act has frozen technological innovation at the 1972 level with the result that U.S. industry is competitively disadvantaged.
2. It describes chemical treatment, the most promising new wastewater treatment technology on the horizon.
3. It makes recommendations for recognizing new chemical treatment technology in the new Clean Water Act.

WHY HAS INNOVATION BEEN FROZEN AT THE 1972 LEVEL?

One of the successes of the 1972 Federal Water Pollution Control Act has been that it not only mandated but also provided substantial grants to construct secondary treatment facilities. By the late 1980's, most inland municipalities had achieved secondary levels of wastewater treatment. The situation in coastal areas, however, was different. Recognizing that coastal waters are mixed by tidal currents and are readily reaerated by virtue of their large surface areas, Section 301(h) of the 1977 Clean Water Act allowed coastal municipalities to propose alternatives to secondary treatment appropriate to the different conditions of marine ecosystems. Over 200 coastal municipalities applied for 301(h) waivers. Most proposed primary treatment plus an extended ocean outfall. In denying the vast majority of these applicants, the Environmental Protection Agency was able to cite the benefits of secondary treatment especially in terms of suspended solids and toxics removals.

The major municipal treatment districts in the Los Angeles and San Diego area began, about 1985, to improve their treatment efficiencies by use of chemical and polymer additives in their primary treatment plants. These changes were designed to meet the effluent and water quality requirements of the California Ocean Plan (COP). This state water quality act recognized that the high level of BOD removal (85%) required by EPA's secondary treatment mandate was unnecessary for effluents discharged offshore. Instead, the COP specified that dissolved oxygen depletion be no more than ten percent below its natural ocean level. Because of concern with heavy metals and other toxics that adsorb onto particulates, the COP requires 75% removal of total suspended solids, only slightly less than the 85% removal required by secondary treatment. This form of treatment is termed Advanced Primary. Based on five or more years of extensive ocean monitoring, a number of scientists at Scripps Institution of Oceanography have testified to the effectiveness of advanced primary treatment and the California Ocean Plan in protecting California's ocean ecology[1]. These communities are now under EPA orders to spend billions of dollars to go to full secondary treatment. Because the 301(h) waivers which were based on the conventional primary treatment alternative have been denied, there is now no administrative process to consider the new chemical treatment alternative. Therefore the promising innovative technologies developed in California have been undermined. Today, with 99% of the 301(h) waivers in the continental United Sates (not including Maine) now denied, the Clean Water Act has achieved regulatory uniformity, but at the expense of its best efforts at innovation.

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[1] San Diego Metropolitan Sewer Task Force Public Hearing. Testimony by Scripps and San Diego State scientists. August 15, 1989, San Diego, Calif., August 15, 1989. (Transcripts available)

The unforeseen effect of the Clean Water Act is that it has frozen wastewater treatment technology at the 1972 level. It has held the United States back from developing new wastewater treatment technologies. It has put us at a competitive disadvantage in terms of overseas competitors. Right now, Norway and Sweden have taken the lead in cutting - edge technologies in the field of wastewater treatment, improving upon the chemical processes pioneered in San Diego, Los Angeles, and Orange County. These Scandinavian countries are selling their chemical treatment technologies in Spain, Poland, and the Soviet Union. Our response must be that the new Clean Water Act actively encourage the development and application of chemical treatment and other innovative technologies.

CHEMICAL TREATMENT

Before I go any further, let me describe chemical treatment.

Our present sequence of wastewater treatment stages came about for historical reasons. At the turn of the century, primary treatment was developed to remove the worst impurities by gravitational settling. By the 1930's, primary treatment proved inadequate to break down organic material so another stage, biological secondary treatment was added. In the 1970's and 1980's, as high nutrient loadings of phosphorus and nitrogen were recognized as the major cause of algal blooms and oxygen depletion, tertiary treatment was prescribed.

What is chemical treatment and how does it fit into these three stages?

Chemical treatment enhances treatment efficiency by adding agents designed to cause coagulation and flocculation of organic compounds and particles. The larger particles formed by this process are readily removed in settling tanks.

Chemical treatment using large quantities of alum or lime has been an alternative to biological secondary treatment for more than 30 years. These chemical processes generated considerably more sludge than biological treatment; in addition, the sludge presented difficult processing and disposal problems. It was not until the mid-1980's that the use of ferric chloride and anionic polymers reduced the concentration of additives to about 10% of that previously used. The break-through in chemical treatment technology came after the 301(h) waivers had been filed.

Chemical additives have always been an essential component of tertiary treatment technology especially in the removal of phosphorus, a key element in controlling eutrophication. Since the mid-1980's, chemical treatment techniques have been refined to the point where we can now use these processes in the primary phase alone yet achieve secondary and tertiary results. Today, chemical treatment, especially at the level developed in Scandinavia, supplants the need to build and operate costly secondary and/or tertiary treatment facilities. These ideas are not merely theoretical. They have been proven in full-scale plant operations in five West Coast facilities, in Ontario, and in over 100 facilities in Norway and Sweden, all of which have been in operation for the past 3-5 years. About 2/3 of the ferric chloride, most of the phosphorus, and all of the biodegradable polymers wind up in the sludge. The high phosphorus content in the process sludge makes that sludge potentially attractive as a soil conditioner. The remaining 1/3 of the ferric chloride remains in the effluent, where it is at such low concentrations that it causes no harmful effects in the marine environment.

WATER QUALITY EFFECTS

Water quality effects are described in the Table you have received. I will summarize the major water quality effects:

1. Suspended Solids: chemical treatment achieves levels of suspended solids removals equivalent to biological secondary treatment.

2. Biochemical Oxygen Demand: chemical treatment is capable of removing 50%-85% of BOD. The secondary treatment BOD standard (85%) is appropriate for fresh water systems but has not been shown to be necessary for municipalities which discharge into the marine environment.
3. Nutrients: the two nutrients of concern are phosphorus and nitrogen. Chemical treatment achieves 95% phosphorus removal compared to 30% phosphorus removal in secondary treatment. In Scandinavia, these high levels of phosphorus removal are considered to be essential in controlling algal blooms and consequent oxygen depletion problems. For discharge into marine environments, they have found that the high levels of phosphorus removal reduce or eliminate the need for the more difficult and costly removal of nitrogen.
4. Toxics: chemical treatment achieves removals of toxics equivalent to secondary treatment.

COST IMPLICATIONS

As you know, the Federal Municipal Waste Treatment Construction Federal Grants Program will terminate in 1992, and unless reinstated, will mean no federal support for construction of new wastewater treatment facilities. Costs, estimated at 10 billion dollars, needed for coastal secondary plants remaining to be built will be passed on to citizens in the form of huge water and sewer rate hikes.

Chemical treatment is the solution to the cost problem. Chemical treatment can be carried out in a primary treatment plant, it entails no new capital costs to fund or build secondary or tertiary facilities. The operation costs of implementing chemical treatment in a primary treatment plant would be about the same as operation costs for secondary treatment. For example, in my sewage district of 200,000 people in Salem, Massachusetts, we are currently under court order to site and build a secondary treatment facility that is estimate to cost $200 million in capital costs and $1 million/year in operating costs. But chemical treatment in our district, (which we are currently testing), will cost only $1 million/year. Similarly, the Massachusetts Water Resources Authority is now in the design stage for new primary and secondary treatment plants to cleanup Boston Harbor. The secondary plant will involve a capital cost of $2 billion dollars and operations costs of $10 million/year. Chemical treatment for Boston Harbor would cost about $10 million/year.

CHEMICAL TREATMENT ALLOWS IMMEDIATE IMPLEMENTATION

The 301(h) waiver process was abused when some coastal municipalities used it to delay building secondary treatment. Today, siting, design and construction of secondary treatment facilities is still as much as 10 years out, with the concommitant delay in cleaning up our coastal waters. Again chemical treatment is the answer because it can be implemented immediately in primary treatment plants.

RECOMMENDATIONS FOR THE NEW CLEAN WATER ACT

We need mechanisms within the new Clean Water Act for Congress and the EPA to encourage rather than discourage promising new technologies which show advantages over biological secondary treatment. Because chemical treatment has not, until recently, been able to met one of EPA's water quality criteria, that of 85% BOD removal, government officials have discouraged initiatives to conduct research or to invest in this process.

The following are recommendations for the new Clean Water Act.

1. Legitimize chemical treatment methods. Where "biological" treatment is cited in the CWA, change the wording to "chemical and biological"
2. Reword Section 301(k), which allows variances for innovative technologies, to promote full scale tests of promising new technologies at selected publicly owned treatment facilities.

3. Section 304(b) recognizes several alternative technologies, Trickling Filters and Waste Stabilization Ponds, as "equivalent to secondary treatment." Include chemical treatment on that list of "equivalent to secondary treatment technologies."

NATIONAL RESEARCH COUNCIL COMMITTEE ON WASTEWATER MANAGEMENT FOR COASTAL URBAN AREAS

In closing I would like to say that a National Academy Committee has recently been constituted to evaluate the scientific, technological and economic bases for wastewater management in urban coastal areas. Prof. Harleman is on that committee and I will work closely with him in that study. It is our hope that the House Water Resources Subcommittee will keep in close touch with the National Research Council Committee in order that the collective wisdom and expertise of both Committees can be brought to bear on the new Clean Water Act. Funding for this NRC committee has been provided by the EPA, City of San Diego, National Science Foundation and the Boston Society of Civil Engineers.

Effectiveness of Different Wastewater Treatment Processes

Treatment Type	TSS Removed	BOD Removed	P Removed	Sludge Produced (Dry wt. / day)
Primary	60%	35%	20%	X
Advanced Primary[1] (Polymer + $FeCl_3$)	80%	50%	85%	1.33 X (TSS) 0.12 X (Chemicals) 1.45 X (total)
Biological Secondary[2]	85%	85%	30%	1.42 X (TSS) 0.48 X (new Biomass) 1.90X (total)
Chemical Secondary[3] (Polymer + $FeCl_3$)	94%	85%	95%	1.57 X (TSS) 0.43 X (Chemicals) 2.00 X (total)

1. Advanced Primary (Polymer)Treatment results are from San Diego, CA -- Pt. Loma plant operations data (Konopka, 1989)
2. Biological Secondary Treatment results are from Black & Veatch Inc., Boston, MA. January 1988. Residual Management Facilities Plan: Draft Characterization of Residuals, Suppl. Rep. No. 1. Prepared for MWRA.
3. Chemical Secondary Treatment results are from Oslo, Norway.

TSS = total suspended solids
BOD = biochemical oxygen demand
P = total phosphorous
$FeCl_3$ = ferric chloride

SEWAGE TREATMENT THE SCANDINAVIAN WAY

Kemira Kemi AB, Helsingborg, Sweden 1989

"In the middle of the seventies the water in Oslo Fjord was in a bad way", explains the director of the SRV works, Paul Sagberg. "Discharge of untreated sewage from the increasingly built-up Oslo region had led to algae blooming. When they died and rotted, all the oxygen in the deeper water layers was consumed with the result that neither fish nor shrimps could live there any longer."

COMPACT TREATMENT

The Westfjord Regional Sewerage Authority (VEAS) was formed in 1976 and is owned jointly by three municipalities, Oslo, Baerum and Asker. VEAS was commissioned to build and operate Norway's largest water pollution control plant, SRV, to treat 104 million cubic metres of water per annum. The project also included a tunnel to collect all wastewater from households, industry and commerce within the three municipalities.

Construction work commenced in 1977 and was completed in 1982 at a total cost of 85 million pounds, equivalent to less than £150 per person.

The primary design criterion was to remove as much phosphorus as possible from the water, but also to achieve acceptable reduction of SS and BOD.

"This is a large plant, but a simple one in principle", says Paul Sagberg. "First we have screens for coarse waste. Then come grit chambers to separate heavier particles. The rest is precipitated with ferric chloride."

If SRV had been built as a conventional three-stage plant, it would have been about four times as large. It is thus very compact.

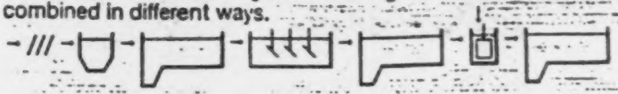
Paul Sagberg, head of the SRV plant.

There are simpler alternatives to three-stage treatment which in many cases can ensure fully acceptable results. One is called direct precipitation, where the chemical treatment stage also deals with the organic contaminants.

This technology is predominant in Norway, and it is also used at many places in Sweden and Finland. The largest direct precipitation plant in Scandinavia is SRV on the Oslo Fjord, which achieves more than 75% BOD reduction and 95% phosphorus removal without any biological treatment whatsoever.

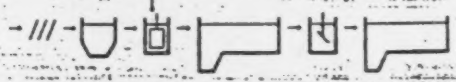
Various arrangements

The various treatment stages in handling wastewater can be combined in different ways.



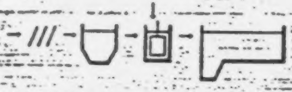
POST-PRECIPITATION

Three-stage process with mechanical, biological and chemical treatment. Very common in Sweden. An efficient and reliable but fairly expensive solution.



PRE-PRECIPITATION

Two-stage process developed in the eighties. Chemical precipitation is combined with mechanical sedimentation in the first stage, which provides high-grade phosphorus reduction as well as around 70% BOD reduction, relieving the load on the biological treatment stage. This stage requires considerably less space and less energy than conventional post-precipitation.



DIRECT PRECIPITATION

Single-stage process with combined mechanical and chemical treatment just as in pre-precipitation, but without subsequent biological treatment. Direct precipitation is quite common in northern Sweden and Finland and is the most usual method of wastewater treatment in Norway.

Results of direct precipitation

(average of fifty-six Norwegian treatment plants in 1985)

	In, mg/l	*Out, mg/l*	*Reduction %*
SS	*387*	*24*	*87.6*
BOD	*229*	*38*	*83*
P_{tot}	*6.2*	*0.5*	*92*

PRECIPITATION: WHAT ARE WE USING?

There is a constant interplay of chemical reactions between various substances in soil and water. When we precipitate contaminants with flocculants at treatment plants, we are using Nature's own processes to remove pollutants from the water.

WHY USE CHEMICAL PRECIPITATION?

Precipitation with chemical flocculants was introduced in Sweden to cure algae blooming which led to oxygen depletion and killed fish in watercourses. A further aim was to improve hygiene by precipitating any organic substances not removed in the biological stage.

Phosphorus (P) was judged to be a critical factor in algae growth in lakes and coastal waters. The reason was that phosphorus was the growth-limiting nutrient, or could be made so by a far-reaching reduction in the supply of phosphorus to watercourses.

The major source of supply was usually municipal wastewater, which receives 2.5 to 4 grams per person per day, of which at most 20-30% can be removed by conventional biological treatment.

This judgement has proved correct, since a marked improvement occurred in the majority of affected watercourses after the introduction of chemical precipitation. It has also been possible to demonstrate that precipitation improves the purification effect with regard to organic substances and infectious agents.

HOW DOES IT WORK?

Phosphorus occurs in water mainly in the form of negatively charged orthophosphate ions ($H_2PO_4^-$, $H_2PO_4^{2-}$). Most of the colloidal particles suspended in the water also have a negative surface charge.

When the flocculant dissolved in the water, positively charged metal ions are released which neutralise the negative charges, forming insoluble compounds that are precipitated as solid particles.

Precipitation properly speaking takes place a few seconds after addition. A process of flocculation then ensues, in which the particles aggregate into increasingly larger flocs. These eventually grow so large that they can be removed from the water by settling.

In this way we can achieve not only a virtually 100% reduction in phosphorus but also a far-reaching reduction in organic contaminants and infectious agents.

Mixing technique is crucial to the results. Precipitation and flocculation usually take place in a series of basins fitted with stirrers that operate at successively lower speeds.

Originally the ferric chloride flocculant was added in the flocculating chambers immediately prior to the settling tanks. Nowadays, ferric chloride is metered at the grit chambers to achieve higher effect.

WHAT DO FLOCCULANTS CONTAIN?

Flocculants for treating wastewater are salts produced from natural minerals. The active constituents are usually trivalent metals, aluminium or iron, which bind phosphorus and other contaminants in the water.

JKL/AVR. The flocculants mostly used in Sweden are JKL (iron chloride, trivalent) and AVR (a mixture of aluminium and iron sulphates, trivalent).

ALG. Iron-free aluminium sulphate used as a flocculant for purifying drinking water.

PAX. More efficient flocculants known as PAX products have recently been developed. They are aluminium hydroxide complexes of high purity and a high (tetra- or pentavalent) positive charge. They enable the desired effect to be achieved with smaller doses of chemicals, while the sludge volume is also lower. Furthermore, the product can be given different compositions, allowing the flocculant to be customised according to the nature of the wastewater.

Iron sulphate (divalent) is used in certain processes.

Lime is sometimes used as a precipitating agent. Unlike the previously mentioned substances, it raises the pH of the water. Lime precipitation requires large dosages in order to have an acceptable effect and thus gives large quantities of sludge which is, however, easily dewatered.

Polymers are the common name for synthetic organic polyelectrolytes, used primarily for flocculating sludge particles in sludge dewatering. They can also be used as a supplement to other flocculants in water purification.

WHAT HAPPENS TO THE FLOCCULANTS?

The metals in flocculants are bound in sparingly soluble compounds with phosphate and organic substances. These are separated as sludge, which then undergoes stabilisation and dewatering before being eventually used as fertilisers where they revert to their natural mineral form. Both iron and aluminium are commonplace substances in Swedish soil. Phosphorus and organic substances also return to the soil, where they provide nourishment for plant and animal life, thereby completing the natural cycle.

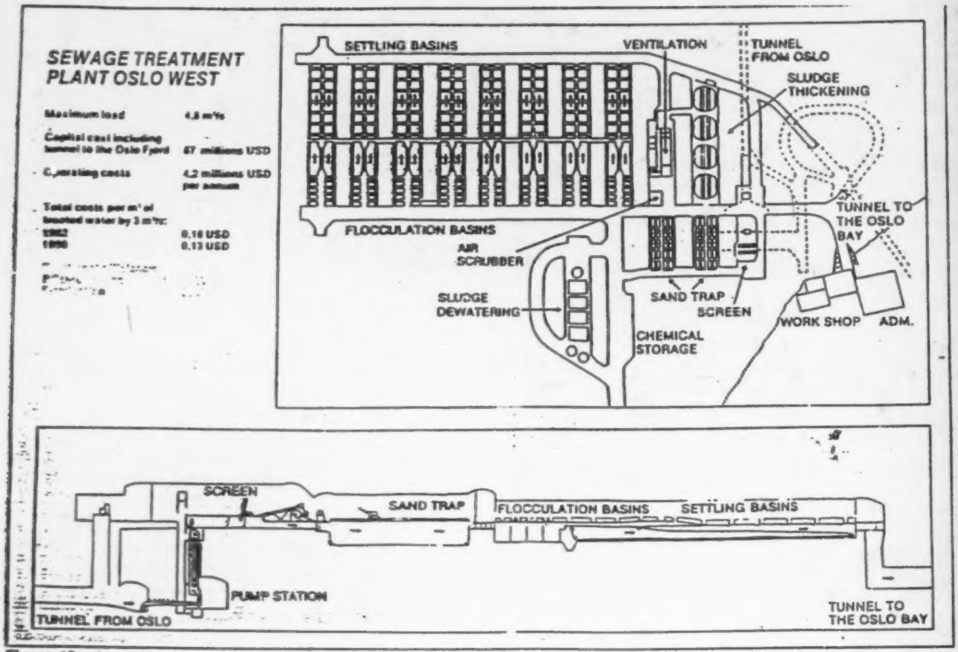

SEWAGE TREATMENT PLANT OSLO WEST
Maximum load 4,8 m³/s
Capital cost including tunnel to the Oslo Fjord 67 millions USD
Operating costs 4,2 millions USD per annum
Total costs per m³ of treated water by 3 m³/s:
1982 0.10 USD
1990 0.13 USD
SETTLING BASINS
VENTILATION
TUNNEL FROM OSLO
SLUDGE THICKENING
TUNNEL TO THE OSLO BAY
FLOCCULATION BASINS
AIR SCRUBBER
SLUDGE DEWATERING
SAND TRAP
SCREEN
WORK SHOP
ADM.
CHEMICAL STORAGE
SCREEN
SAND TRAP
FLOCCULATION BASINS
SETTLING BASINS
PUMP STATION
TUNNEL FROM OSLO
TUNNEL TO THE OSLO BAY

Figure 13 [illegible]

NATIONAL UTILITY CONTRACTORS ASSOCIATION
1235 JEFFERSON DAVIS HIGHWAY, SUITE 606
ARLINGTON, VIRGINIA 22202-3283
(703) 486-2100

STATEMENT OF

RON PACELLA, PRESIDENT-ELECT

NATIONAL UTILITY CONTRACTORS ASSOCIATION

HEARINGS BEFORE

THE SUBCOMMITTEE ON WATER RESOURCES

U.S. HOUSE OF REPRESENTATIVES

ON THE REAUTHORIZATION OF THE

FEDERAL WATER POLLUTION CONTROL ACT

MARCH 22, 1990

CONSTRUCTORS OF WATER, SEWER AND UNDERGROUND UTILITY SYSTEMS

Mr. Chairman, my name is Ron Pacella, President-Elect of the National Utility Contractors Association (NUCA). Our national membership organization is comprised of 2,000 construction businesses that build water, sewer and other underground facilities. I am also President of a construction firm, R J V Construction, in Canton, Massachusetts.

It is my pleasure to represent NUCA before the Subcommittee on Water Resources during hearings on the Federal Water Pollution Control Act (hereafter referred to as the Act). As you know, the Act is the primary federal program for municipal wastewater treatment construction funds through the U.S. Environmental Protection Agency. This Subcommittee was the starting point for the transition from the old construction grants program to an innovative financing mechanism -- the state revolving loan fund (SRF) program.

Instead of direct grants to local levels of government, the Act make a radical departure by giving states capitalization grants to establish SRF's. Local governments apply to the states for a construction loan from the SRF. As the loan is repayed, new capital will be used to finance future wastewater treatment construction projects. 43 states have approved SRF's, which is testimony to the widespread acceptance of the innovative program by state governments. The most important selling point to the utility construction industry was the assurance of a steady and dependable source of future sewer funding.

Regrettably, the actual amount of federal capitalization funds appropriated to states has not been at the authorized levels under the Act. Even at full appropriation levels, my understanding is that SRF'S are not adequately capitalized to assume the entire finanicial responsibility for a conservative $68 billion in current wastewater treatment needs. It is timely for this Subcommittee to undertake this review, and to consider several related public policy issues in light of recent events.

Water and sewer funding is the top NUCA priority. Our organization believes that funding for wastewater treatment programs should be funded at the levels authorized by the Act. Second, current law should be amended to delete the requirement that muncipalities must repay prior EPA grants before entering privatization construction projects. Our association has established a top level working group to examine the future of water and sewer funding in light of the possible phase-out of EPA's wastewater treatment program under the Act. Let me take this opportunity to share our preliminary thinking.

Congress may need to reopen the Federal Water Pollution Control Act primarily due to the federal funding shortfall. A question needing further examimation is federal mandates for wastewater treatment categories projects that are not eligible for SRF funds. However, a new or renewed federal grant program could endanger the future of SRF's. NUCA as well as our national network of affiliated chapters, were able to convince many state legislatures and governors to establish SRF's because the existing construction grants program is set to expire on September 30, 1990. In other words, "a use it or lose it proposition" was a driving force in those legislative campaigns.

Our main concern is that Congress should be careful of undermining state programs. The State of New Jersey, for example, was one of the first in the Nation with an SRF, and they are considering a re-capitalization with state funds. On the other hand, West Virginia is one of the last states that is considering legislation to establish an SRF. In my home state of Massachusetts, a law was passed, with my local chapter's support, to establish an SRF. A major bond issue was subsequently authorized. But the bond rating collapsed, and construction funds have not been forthcoming. The states have demonstrated a good faith effort. As with any new program, the initial results have been mixed.

The Subcommittee should also note that water and sewer grant funding is available through the Farmers Home Administration. Many of the smaller and poorer rural communities lack the rate base to finance these vital public facilities. We were pleased that the majority of the House and many Members on the Public Works Committee voted for an amendment to protect funding for this program during consideration of the Rural Economic Development Act. NUCA appreciates your support.

A second worthwhile issue is the implementation of a national infrastructure act with a dedicated source of federal funding. The Public Works Committee has held extensive hearings on various legislative proposals in the past. Although the main obstacle to these initiatives is the funding source, some Members of Congress have suggested gasoline tax increase to support an infrastructure program, which should include water and sewer construction programs.

And finally, a long-range alternative is the establishment of a water and sewer trust fund. A report by the National Council on Public Works Improvements recommended, "Financing of a larger share of the cost of public works by those who benefit from services." A dedicated source of funding could involve a federal surcharge on (1) the sale of water and sewer materials; (2) water use and/or consumption; (3) per capita consumption; (4) a combination of the above; or (5) other appropriate measures. Such a trust fund should be off-budget so that unspent balances are not credited toward the federal deficit. The Subcommittee may wish to examine these alternatives in further detail by requesting a formal study by the appropriate legislative agency.

Thank you for the opportunity to present our association's views.

* * *

DEPARTMENT OF THE ARMY

COMPLETE STATEMENT OF
BRIGADIER GENERAL JUDE PATIN
DIVISION ENGINEER, NORTH CENTRAL DIVISION
U.S. ARMY CORPS OF ENGINEERS

BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES
OF THE HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE

22 MARCH 1990

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, MY NAME IS BRIGADIER GENERAL JUDE PATIN. I AM THE COMMANDING GENERAL OF THE NORTH CENTRAL DIVISION OF THE U.S. ARMY CORPS OF ENGINEERS. IT IS MY PLEASURE TODAY TO MAKE THIS FIRST APPEARANCE BEFORE YOUR COMMITTEE AND TO DISCUSS OUR RECONNAISSANCE STUDY OF ONONDAGA LAKE, NEW YORK. WITH ME FROM MY DIVISION ARE TWO INDIVIDUALS WHO ARE INTIMATELY INVOLVED IN THE DEVELOPMENT AND EXECUTION OF THIS STUDY. THEY ARE COLONEL HUGH BOYD, THE BUFFALO DISTRICT ENGINEER AND MR. DAVID MACPHERSON, THE ONONDAGA LAKE STUDY MANAGER.

THIS AFTERNOON OUR REPORT WILL PRESENT A BRIEF OVERVIEW OF ONONDAGA LAKE, OUR SPECIFIC AUTHORITY, THE PROCESS WE USE IN THE CORPS FOR STUDIES OF THIS TYPE, AND THE STATUS OF OUR CURRENT EFFORTS REGARDING ONONDAGA LAKE.

FIRST, I SHOULD REITERATE THE ARMY POSITION ON THE SITUATION AT ONONDAGA LAKE. THIS POSITION WAS INCLUDED IN THE ARMY'S LETTER REPORT ON S. 2183, WHICH WAS PROVIDED TO CONGRESS ON MARCH 20, 1990. IT HAS BEEN THE ADMINISTRATION'S POSITION THAT CLEANUP OF ONONDAGA LAKE IS NOT AN APPROPRIATE FUNCTION OF THE FEDERAL WATER RESOURCES DEVELOPMENT PROGRAM. THERE ARE ALREADY A NUMBER OF FEDERAL PROGRAMS DESIGNED TO ADDRESS WASTEWATER CLEANUP, AND CLEANUP OF ONONDAGA LAKE SHOULD BE PURSUED UNDER THESE PROGRAMS -- NOT UNDER SPECIAL PROGRAM AUTHORIZATION.

ONONDAGA LAKE IS LOCATED ADJACENT TO AND NORTHWEST OF THE CITY OF SYRACUSE, NEW YORK. THE LAKE IS APPROXIMATELY 1 MILE WIDE BY 4.5 MILES LONG BY 60 FEET DEEP. IT EMPTIES INTO THE SENECA RIVER WHICH FLOWS NORTH INTO THE OSWEGO RIVER WHICH FLOWS INTO LAKE ONTARIO. EIGHTY PERCENT OF THE SHORELINE OF THE LAKE IS PUBLICLY OWNED. THE SYRACUSE AREA HAS A POPULATION OF 450,000 AND HAS TRADITIONALLY SUPPORTED THE HEAVY INDUSTRIES OF STEEL AND CHEMICAL PRODUCTION. THE HEAVY INDUSTRY HAS DECLINED AND HAS BEEN REPLACED BY THE LIGHT INDUSTRIES OF DAIRY PRODUCTS AND TESTING LABORATORIES. SYRACUSE UNIVERSITY ALSO REMAINS A LARGE EMPLOYER IN THE AREA. THE WATER QUALITY OF THE LAKE SEVERELY LIMITS THE RECREATIONAL OPPORTUNITIES. THERE IS NO SWIMMING PERMITTED AND THE FISH ARE NOT EATABLE. THERE ARE EXTENSIVE MERCURY AND CALCIUM CONTAMINANTS WHICH ADVERSELY AFFECT ANY EFFORTS OF THE LAKE TO CLEAN ITSELF. THE WASTE WATER EFFLUENT PROBLEM HAS CONSIDERABLY IMPROVED WITH THE ADDITION OF A SECONDARY TREATMENT PLANT, BUT COMBINED SEWER OVERFLOW

LIMITATIONS CONTINUE TO RESULT IN CONTAMINATED EFFLUENTS DURING STORMS.

THE JUNE 1989 RESOLUTION OF THE SENATE ENVIRONMENTAL AND PUBLIC WORKS COMMITTEE GAVE THE CORPS AUTHORITY TO PERFORM A STUDY TO DETERMINE WHAT IMPROVEMENTS IN THE INTEREST OF WATER QUALITY AND ENVIRONMENTAL ENHANCEMENT ARE ADVISABLE FOR ONONDAGA LAKE FROM A FEDERAL PERSPECTIVE. FUNDS IN THE AMOUNT OF $250,000 WERE INCLUDED IN THE FISCAL YEAR 1990 ENERGY AND WATER DEVELOPMENT APPROPRIATIONS ACT FOR THE CORPS TO INITIATE THE STUDY.

WE TAKE ON THESE TYPES OF ASSIGNMENTS BY FOLLOWING A SYSTEM APPROACH. IN THE RECONNAISSANCE PHASE, WE ENDEAVOR TO:

- DEFINE THE PROBLEMS AND IDENTIFY OPPORTUNITIES;

- IDENTIFY POTENTIAL SOLUTIONS TO THE PROBLEMS AND WAYS TO REALIZE THE OPPORTUNITIES;

- DETERMINE BENEFITS, COSTS AND ENVIRONMENTAL IMPACTS OF THE VARIOUS ALTERNATIVES;

- DETERMINE IF FURTHER STUDIES MEET ADMINISTRATION PROGRAM REQUIREMENTS;

- PROVIDE AN ESTIMATE OF THE TIME AND COST FOR THE NEXT

SYSTEM ACTIVITY, WHICH WE CALL THE FEASIBILITY PHASE; AND

- DETERMINE IF THERE IS A NON-FEDERAL INTEREST WILLING TO SHARE THE COSTS OF FURTHER STUDIES.

WE PROCEED TO THE FEASIBILITY PHASE ONLY IF WE IDENTIFY AT LEAST ONE POTENTIAL SOLUTION THAT WILL LIKELY HAVE ADMINISTRATION SUPPORT AND BE SUPPORTED BY A COST-SHARING NON-FEDERAL SPONSOR. IN THE FEASIBILITY PHASE, WE FURTHER ANALYZE THE ALTERNATIVES, IDENTIFY THE PROJECT FROM THE ALTERNATIVES, AND COMPLETE THE ENVIRONMENTAL DOCUMENTATION.

FOR ONONDAGA LAKE, CONGRESS HAS PROVIDED FUNDS FOR THE RECONNAISSANCE PHASE, SO LET ME REVIEW FOR YOU OUR ACTIONS ON THIS PHASE OF THE STUDY.

THE BUFFALO DISTRICT HAS ESTABLISHED AN INTERDISCIPLINARY TEAM OF QUALIFIED ENVIRONMENTAL ENGINEERS, BIOLOGISTS, ECONOMISTS, AND OTHERS TO PERFORM THE VARIOUS ASPECTS OF THE STUDY.

COORDINATION MEETINGS HAVE BEEN HELD DURING THE PAST MONTHS WITH REPRESENTATIVES FROM OTHER FEDERAL, STATE, AND LOCAL AGENCIES TO GATHER DATA AND COORDINATE PREVIOUS STUDY EFFORTS.

IN FEBRUARY WE PARTICIPATED IN A WORKSHOP WHICH BROUGHT TOGETHER EXPERTS FROM ALL OVER THE WORLD TO SPECIFICALLY REVIEW

AND DISCUSS THE ONONDAGA LAKE CONTAMINATION PROBLEM.

ON FEBRUARY 14 OF THIS YEAR, I PARTICIPATED ALONG WITH SENATOR MOYNIHAN AND GOVERNOR CUOMO OF NEW YORK IN THE INITIAL MEETING OF THE ONONDAGA LAKE MANAGEMENT CONFERENCE. COLONEL BOYD AND HIS STAFF RECENTLY PARTICIPATED IN A FOLLOW-UP WORKING LEVEL MANAGEMENT CONFERENCE ON MARCH 16, IN SYRACUSE DURING WHICH APPOINTMENTS TO THE TECHNICAL ADVISORY COMMITTEE AND THE CITIZEN'S ADVISORY COMMITTEE WERE DISCUSSED.

WE HAVE SET THE FOLLOWING SPECIFIC OBJECTIVES AS CRITICAL TO THE SUCCESSFUL ACCOMPLISHMENT OF THIS RECONNAISSANCE PHASE:

- DEFINE THE EXTENT OF THE WATER QUALITY PROBLEMS AND IDENTIFY POTENTIAL SOLUTIONS;

- DETERMINE THE EXTENT OF ADMINISTRATION POLICY SUPPORT FOR A FEDERAL ROLE IN IMPLEMENTATION;

- ESTIMATE THE FEASIBILITY PHASE TIME AND COSTS FOR BOTH FEDERAL AND NON-FEDERAL PARTICIPANTS AND;

- ASSESS NON-FEDERAL INTEREST AND SUPPORT.

A SCOPE OF WORK HAS BEEN PREPARED WHICH OUTLINES THE INDIVIDUAL TASKS AND SCHEDULE. THESE INDIVIDUAL TASKS ARE SHOWN

ON THIS CHART. THE DISTRICT ANTICIPATES COMPLETING THE RECONNAISSANCE STUDY PERIOD IN MAY 1991.

IN CLOSING, LET ME RESTATE THAT CLEANUP OF ONONDAGA LAKE IS MORE APPROPRIATELY ADDRESSED UNDER EXISTING FEDERAL PROGRAMS FOR WASTEWATER CLEANUP. THE CORPS IS AVAILABLE TO OFFER ITS EXPERTISE ON A REIMBURSABLE BASIS.

MR. CHAIRMAN, THIS CONCLUDES OUR STATEMENT. I WILL BE HAPPY TO ANSWER ANY QUESTIONS OR COMMENTS THAT YOU OR MEMBERS OF THE SUBCOMMITTEE MIGHT HAVE.

CHAIRMAN
NICHOLAS J. PIRRO
County Executive
Onondaga County

MEMBERS
THOMAS G. YOUNG
Mayor City of Syracuse
MARIO M. CUOMO
Governor
State of New York
ROBERT H. ABRAMS
Attorney General
State of New York
GEN. JUDE W.P. PATTIN
U.S. Army
Corps of Engineers
CONSTANTINE SIDAMON-ERISTOFF
Administrator
Region II EPA

Onondaga Lake Management Conference

EX OFFICIO
SEN. DANIEL PATRICK MOYNIHAN
SEN. ALFONSE M. D'AMATO
REP. JAMES T. WALSH

TIMOTHY P. MULVEY
Executive Director

Testimony of
NICHOLAS J. PIRRO
County Executive
Onondaga County, New York
March 22, 1990
before
House Subcommittee
on
Water Resources
Hon. Henry J. Nowak
Chairman

Mr. Chairman, the Honorable members of this subcommittee, ladies and gentlemen:

I want to thank you for the opportunity to tell you how much cleaning up Onondaga Lake means to the environment. It really goes far beyond that. Undertaking this project will send an important message to every corner of this great land -- that we are committed, as a nation, to righting a tremendous environmental wrong.

You should also know how much I personally, and the community at large, appreciate what your colleagues who represent Central New York have done to increase our hope and help advance the project through the legislative process.

Creation of the Lake Management Conference and the approval of 500 thousand dollars to begin to study the lake is certainly a welcome first step. At our organizational meeting the presence of Senator Moynihan, Governor Cuomo, Congressman Walsh, Mayor Young and the other participants left no doubt that individuals at the highest levels of the local, state and federal governments were of one mind -- restoring Onondaga Lake.

It is our belief that the United States Government has a responsibility to help fund the cleaning of a lake inside New York State.

Without taking too much time, or attempting to go into details better left to the scientists, I will tell you why I believe in the necessity of federal financial involvement.

Onondaga Lake is a multi-jurisdicitional body of water.

It is part of this nation's navigable inland waters and connects Central New York with the Great Lakes and the world. Thus, it falls under multiple jurisdictions -- federal, state and local.

P.O. BOX 7136 SYRACUSE, NEW YORK 13261

We maintain that for this reason the lake's remediation and management requires multiple levels of government intervention.

Described as the most polluted lake in North America, the waters of Onondaga Lake are a major source of pollution of the entire Seneca-Oswego River system -- the largest tributary of Lake Ontario. You can see that by halting the fouling of these rivers, we would derive the direct and immediate benefit of improving Ontario water quality -- a goal of the U.S.-Canada Great Lakes Water Quality Agreement.

We cannot think of Lake Ontario as merely a boundary. It is a major economic and environmental resource for our region. It is Onondaga County's major drinking water supply. That water has drawn two major breweries to our county. And this high quality water is an international asset for fishing, swimming, boating and economic development.

It's ironic how economic development can be both the reason to protect a natural resource and an excuse to ruin it. Perhaps no other U.S. body of water has been exposed to such a variety of pollutants from such a diversity of sources for such a long period of time.

A century ago, when our natural resources seemed boundless and when environmental science was unheard of, our forefathers traded jobs and payrolls for the pollution that destroyed the lake.

People call Onondaga Lake a cesspool. Yet, although you wouldn't want to take your family on a picnic at a cesspool...more than 600 thousand people used Onondaga Lake Park last year. A county facility virtually encircles this lake.

80 percent of the lake shore is publicly owned, thus ensuring that when it is cleaned the lake will be preserved as one of the few public metropolitan water resources in the country.

Onondaga Lake has played a role in a number of national events including the U.S. Olympic Festival, the National Intercollegiate Rowing Championships, the Pan American Games Rowing Trials, National Hydroplane Circuit Racing, the U.S. Junior Olympics...and in 1991 the U.S. Senior Olympics will sue the lake and surrounding park.

Even those not as optimistic as I about the lake will agree that improved water quality can only lead to additional national and international sporting events.

We do not come here saying, you -- the federal government alone -- should pay.

We have already made a substantial financial commitment since 1972, spending well over 310 million dollars. This has been federal, state, county and private money, We are beginning to see improvements in water quality. But, continuing waste bed leachate and the problems associated with our antiquated combined sewer overflows means pollution remains an ongoing, troublesome problem.

Your help can result in stopping the pollution that continues to enter the lake...while allowing us to begin the massive task of remediating this body of water from the chemical ooze on the floor to the bacteria near the surface.

In our estimation, remediation is possible. We say that based upon our progress to date. No longer is the lake characterized by floating gobs of decaying algae, debris and sewage.

Now, the bacterial levels are down, lake transparency is at an all time high and ecologically diverse zooplankton populations are now present and beginning to thrive.

Private developers see the potential. The largest mall in the Northeast is being constructed on the south shore, and a few blocks away -- the old factories are being turned into restaurants, shops and offices.

Our lake advisory group is talking about reestablishing the Atlantic Salmon -- the king of freshwater fish that once flourished here.

Yes, our goals are ambitious.

We join with our optimistic federal representatives who believe as we do, that our vision can become reality -- an Onondaga Lake that is swimmable, fishable and even drinkable in our lifetime.

I invite you to visit our community, see our lake and its potential. We believe once you understand that this lake, where Hiawatha once roamed, is a national resource worthy of your consideration. You, too, will view it with the same commitment and fervor as Senators Moynihan, D'Amato and Congressman Walsh.

In closing, I want to again express the gratitude of all the people who care about the environment for what you have done so far. I ask for your continued support to help us rewrite history by rejuvenating and restoring Onondaga Lake, and thus returning it to the people.

Thank you for your time.

SIERRA CLUB ATLANTIC CHAPTER

ONONDAGA LAKE RESTORATION ACT

HOUSE OF REPRESENTATIVES, PUBLIC WORKS COMMITTEE

HEARING DATE: MARCH 22, 1990

TESTIMONY OF JULIA PORTMORE, REPRESENTING THE SIERRA CLUB, ATLANTIC CHAPTER

- Executive Director, American Clean Water Project, Inc., a not-for-profit corporation
- Chairman, Sierra Club, Atlantic Chapter, Water Pollution Committee
- Interim Chairman, Sierra Club, Atlantic Chapter, Great Lakes Committee
- Chairman, Environmental Subcommittee, Onondaga Lake Advisory Committee
- Member, Citizens Advisory Committee for the Oswego Harbor Remedial Action Plan

In keeping with the New Year's tradition of blessing the waters near its place of worship, the congregation of the Russian Orthodox church in Syracuse has prayed for Onondaga Lake. And, indeed, until the Onondaga Lake Restoration Act was introduced, it appeared that divine intervention would be the lake's only means of salvation. From its past glory as a grand resort, Onondaga Lake has become one of the most polluted bodies of water in the world.

In the late 1800's, the 4.5 square mile lake was a prime tourist attraction, as well as the center of a thriving commercial whitefish industry. At about the same time, Allied Chemical Company began producing soda ash at its plant on the lake's west shore, beginning the process that led to the lake's demise. Scientists say that between 20 and 40 percent of the lake has been filled in with Allied's waste, creating a 15 to 30 foot layer of black sediments. This waste has included tons of sodium chloride and calcium chloride, deposited over a period of 100 years, as well as 20 POUNDS OF MERCURY DUMPED EACH DAY FOR 18 YEARS, until halted by the federal government in 1970. An extensive coring of Onondaga Lake sediments was carried out by the N.Y. State Department of Environmental Conservation in 1986 and 1987 (NYSDEC, 1989, Draft Engineering Investigations at Inactive Hazardous Waste Sites), where concentrations of mercury as high as 85.37 ug/g were found. The background range for New York soils is 0.02 to 0.05 ug/g.

J. PORTMORE, SIERRA CLUB

In addition, a plume of toxic benzene from Allied's former chlorobenzene factory on the site seeps slowly through the ground toward this once glorious natural resource. The Allied operation closed down completely in 1986.

Despite Allied's role in the lake's decline, there is plenty of blame to go around, for virtually everyone in the area has polluted Onondaga Lake. Crucible Steel dumped its chromium waste, Bristol-Myers Company added organics from its penicillin plant, and LCP Chemicals, which acquired the Allied mercury cell plant in 1979, discharged mercury, caustic soda and sodium hypochlorite until it closed its Syracuse operations in 1988. (N.Y. State Dept. of Environmental Conservation, Draft Oswego River Remedial Action Plan, Oct. 1989) And, as did many other cities in years past, Syracuse used the lake as a sewer. Meanwhile, both the tourists and the whitefish are gone.

Numerous studies have been done in the past in an attempt to begin cleanup, but only now are all segments of the community seriously joining in the fight to save the lake. The movement began in 1986, when the N.Y. State Department of Environmental Conservation established the Onondaga Lake Advisory Committee.

The Committee members represent various perspectives, including the local governments, environmental groups, area businesses and sportsmen. Several years were spent studying the myriad of problems which had an effect on the lake, and an environmental matrix was prepared. (See Figure 1.) This matrix showed the existing environmental issues and the water quality conditions they impacted. One by one, the issues were addressed, and the Advisory Committee became the focal point for community discussions on lake related matters. Out of the Committee's deliberations, have come recommendations for action and the impetus for public education efforts.

Indeed, problems which can be solved on the local level are already being attacked. Two Onondaga County sewage pumping stations are being upgraded, and plans for upgrading the Metropolitan Sewage Treatment plant are ready, awaiting the results of modeling studies now underway. Next, in order, will be the replacement of the city's antiquated system of combined sewer overflows.

Most importantly, the people of Syracuse and of Onondaga County have a goal - SALMON 2000! Atlantic salmon are native to the watershed, and the objective is to reintroduce the species and have it thrive once again in Onondaga Lake and its tributaries.

J.PORTMORE, SIERRA CLUB

However, as we mentally picture migratring salmon, we must remember that Onondagada Lake is not a body of water unto itself. It is part of the Oswego River Basin, a large area which includes Oneida Lake, Canandaigua Lake and the Finger Lakes, as well. All eventualy flow into the Oswego River, which flows directly into Lake Ontario (See Figure 2). And, as with Onondaga Lake, the sediments of Oswego Harbor, as the river enters the Great Lakes, ARE CONTAMINATED WITH MERCURY!

So that we may better understand the implications of this finding, let us briefly go back in history. In order to provide a mechanism for resolving problems of the Great Lakes and other border areas, the United States and Canada established the International Joint Commission (IJC) in 1909. Through this binational organization, the two governments signed a Great Lakes Water Quality Agreement in 1972, providing the focus for a coordinated cleanup effort to control eutrophication of the Lakes. The agreement was revised and expanded in 1978 to include control of toxic substance loading, and to protect the water quality and health of the entire Lakes system. As a result of the two Agreements, more than $8 billion has been spent thus far by the two countries, the eight Great Lakes states and the Province of Ontario to clean up pollution from municipal sources. A similar amount has likely been spent to eliminate or lessen pollution entering the lakes from industrial sources, including toxic substances. (IJC ~~Brochure,~~ Remedial Action Plans for Areas of Concern

Yet, despite considerable progress over the past decade, serious problems remain. The IJC has listed 42 "toxic hot spots" - called Areas of Concern - in the Great Lakes Basin. One of these is Oswego Harbor. The New York State Department of Environmental Conservation has found that the levels of copper, lead, zinc and mercury exceed water quality standards or guidance values in Oswego Harbor, and these metals are found in fish tissues in high levels, as well. Further, when testing is done, it is believed likely that mercury will be found in the sediments of the Oswego River between Onondaga Lake and the Harbor. Stage I of the Remedial Action Plan for Oswego Harbor cleanup, being prepared by the Department of Environmental Conservation and its Citizens' Advisory Committee, states that, " Mercury, mirex and dioxin have been identified as substances that are causing impairments in Lake Ontario and that may be transported through or out of the area of concern and into Lake Ontario in significant amounts. The largest source of mercury is the bottom sediments of Onondaga Lake."

J. PORTMORE, SIERRA CLUB

In signing the Great Lakes Water Quality Agreement, Canada and the United States have committed themselves to the goals of virtual elimination of all persistent toxic substances to the Great Lakes. To reach these goals, it is imperative that the 42 contaminated Areas of Concern, including Oswego Harbor, be remediated. And, in order to remediate Oswego Harbor, it is absolutely necessary to remediate Onondaga Lake. The flow of mercury, and other toxic materials from Onondaga Lake into Lake Ontario must be stopped!

Therefore, we strongly support the Onondaga Lake Restoration Act, which will allow this most important work to be completed. We urge you, the members of the House of Representatives, to join with members of the Senate in passing this vital piece of legislation. And we thank you for providing the opportunity for us to testify at this hearing.

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ONONDAGA LAKE:

ENVIRONMENTAL ANALYSIS MATRIX

ENVIRONMENTAL ISSUES	USE-LIMITING WATER QUALITY CONDITIONS							OTHER RELATED CONDITIONS				
	CONTACT RECREATION		FISHERY									
	TRANSPARENCY*	BACTERIA*	DISSOLVED OXYGEN*	MERCURY*	AMMONIA*	FISH HABITAT	SYNTHETIC ORGANICS	ALGAE	CALCIUM	PHOSPHORUS	STRATIFICATION	SALINITY
1 RAW SEWAGE OVERFLOWS	o	◯								o		
2 COMBINED SEWER OVERFLOWS (CSO)	o	◯								o		
3 METRO SEWAGE PLANT DISCHARGE	◯	o	◯		?		?	◯		◯		
4 ALLIED IMPACT [illegible]	◯		◯	◯		◯	?		◯		◯	◯
5 LAKE BOTTOM MATERIALS			◯	◯	?	◯	?					
6 OIL CITY							?					
7 NON-POINT INPUTS	o	o	o		o		?	o		o		o

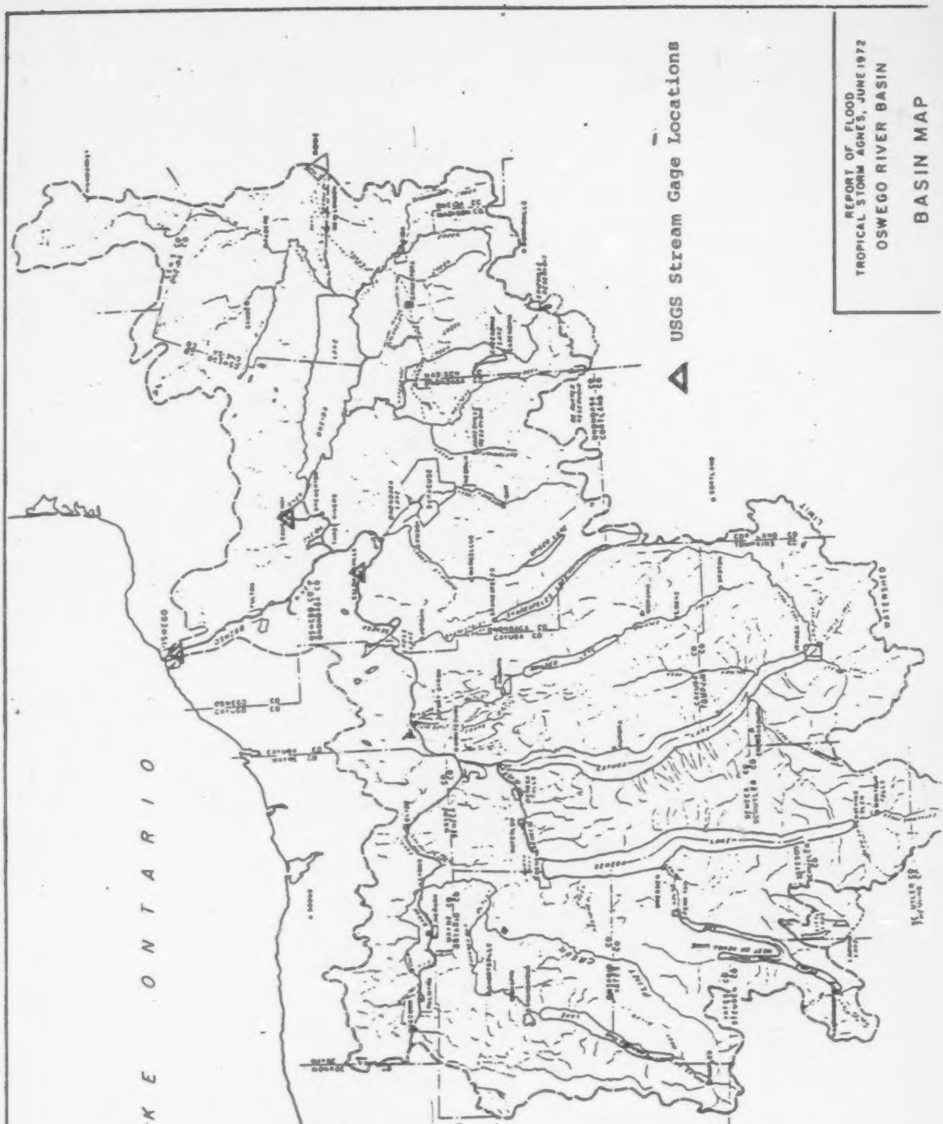
◯ MAJOR IMPACT

o MINOR IMPACT

? UNKNOWN IMPACT

* INVOLVES FEDERAL OR STATE REGULATORY STANDARD

MATRIX PREPARED BY THE ENVIRONMENTAL SUB-COMMITTEE OF THE ONONDAGA LAKE ADVISORY COMMITTEE


LAKE ONTARIO
USGS Stream Gage Locations
REPORT OF FLOOD
TROPICAL STORM AGNES, JUNE 1972
OSWEGO RIVER BASIN
BASIN MAP

WPCF Research Foundation

WATER POLLUTION CONTROL FEDERATION
RESEARCH FOUNDATION

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STATEMENT OF

H. GERARD SCHWARTZ, Jr., Ph.D., P.E.

CHAIRMAN, WPCF RESEARCH FOUNDATION

ON BEHALF OF THE

WATER POLLUTION CONTROL FEDERATION (WPCF)

RESEARCH FOUNDATION

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES

HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE

OVERSIGHT HEARING ON THE 1987 WATER QUALITY ACT

March 22, 1990

Good morning, I am Dr. Gerard Schwartz, President of Sverdrup Environmental, Inc., an environmental engineering consulting firm based in St. Louis, Missouri. I am here today as Chairman of the Board of the Water Pollution Control Federation Research Foundation, which I will refer to throughout as the WPCF Research Foundation. I have with me today fellow Board Member and President of the Columbus Water Works in Columbus, Georgia, Billy Turner, and the Director of the WPCF Research Foundation, Glenn Reinhardt.

You just heard from the WPCF Research Foundation's parent organization, the Water Pollution Control Federation. The Federation's Directors created the WPCF Research Foundation after recognizing certain long-term trends:

1. Federal funds available for wastewater research were being diverted to other media (ie., land and air).

2. Specific funding for practical wastewater treatment technological and process research had declined from $15.6 million to only $250,000 over the past twelve years.

3. Wastewater research continued to be regulatory based, rather than directed toward processes and technologies.

4. America was losing its competitive edge in world markets for wastewater treatment technologies.

5. The nation's $50 billion investment in wastewater treatment facilities needed to be protected.

Therefore, the Water Pollution Control Federation extended a $300,000 long-term, interest free loan to the WPCF Research Foundation, allowing the wastewater treatment industry to begin creating its own research entity.

The U.S. Environmental Protection Agency's current wastewater research and development budget is focused on regulatory issues rather than technology and process development. This means while EPA is developing more sophisticated techniques to measure pollutants and regulate industry and municipalities, both industry and municipal utilities lack the resources to develop the sophisticated technologies necessary to meet these regulations.

Here are some municipal and industrial problems that need to be addressed through research:

1. How to treat the trillions of gallons of inadequately treated wastewater which cause receiving waters to collect problematic levels of suspended solids, nutrients, and toxics.

2. How to manage an aging infrastructure and premature deterioration at facilities with the increased demands of a growing population.

3. How to develop processes and technologies to treat the 70,000 chemicals currently in use, and the 500 new chemicals introduced annually.

4. How to meet more restrictive discharge standards for treatment facilities.

5. How to safely dispose of millions of tons of sludge generated on a daily basis.

These are only five critical problems facing the wastewater industry. Attachment #1, Research Needs, lists the many problems which municipalities and industry are being called upon to solve.

Any one of the research needs listed, whether it is sludge disposal, toxics, water quality effects, air emissions from treatment plants, or others, require substantial investment. It is clear that the resources of a single municipality or company are easily exhausted when faced with acting independently. Until now, the only option was to "go it alone."

The WPCF Research Foundation is building a consortium of wastewater treatment facilities to address the growing research needs of the pollution control industry. Modeled after other successful industry sponsored research efforts such as the Electric Power Research Institute, Gas Research Institute, and American Water Works Association Research Foundations, the WPCF Research Foundation is creating a subscription based funding mechanism to support practical, applied research identified by the wastewater industry, for the wastewater industry.

The subscription based funding mechanism will involve municipal wastewater treatment facilities, consulting firms, wastewater equipment manufacturers, industrial wastewater dischargers, and others. Since the Research Foundation's incorporation in April of last year, we have received broad support from consulting firms and municipalities. Time has prevented our approach to the other groups mentioned.

Acting on behalf of the wastewater treatment industry, the WPCF Research Foundation has proceeded at break-neck pace to build a viable research entity to rejuvenate the sizable effort once in federal domain. But we need your help. The WPCF Research Foundation is proposing to Congress a new cooperative, cost-sharing partnership between the wastewater industry and EPA in support of wastewater research and development.

The WPCF Research Foundation is seeking such sums as necessary be made available for fiscal years beginning in 1991, 1992, and 1993 for this purpose, but no more than $2.5 million per year. The Research Foundation seeks this authorization to establish a pilot program providing a match of research funds from the wastewater industry in a ratio of 1 to 1. We also propose an administrative mechanism be set up between EPA and the wastewater industry to determine research needs and select projects. This cooperative effort will double the federal investment, provide a practical focus for wastewater research, encourage additional support for the Research Foundation, and provide the "jump-start" necessary for the Foundation to become fully self sufficient.

Attachment #2 identifies the WPCF Research Foundation's 1990 research agenda, which is fully funded by the wastewater industry. These projects, called "Agenda Setting Assessments" were chosen by consensus of the wastewater industry to explore promising technologies worthy of additional support by the Research Foundation. Our ability to meaningfully fund any of the specific projects resulting from these assessments will be determined by this Subcommittee's support for authorization of a $2.5 million cooperative grant as an add-on to EPA's fiscal 1991 budget.

The long term results of this cooperative effort will be:

1. Protection of the federal governments $50 billion investment in wastewater treatment facilities.

2. Economically feasible alternatives to pollution abatement.

3. Placing America in a position of leadership and competitiveness with other nations in producing innovative and cost effective pollution control technologies, and...

4. We will be protecting the 3% of the planets water supply which is fresh.

I would like to yield at this time to Mr. Billy Turner, who will provide a municipal perspective on the role the WPCF Research Foundation will play in the wastewater industry. After Mr. Turner's brief statement, we will both remain available to answer any questions you might have.

WPCF RESEARCH FOUNDATION

RESEARCH NEEDS

RESEARCH NEEDS

Revised 7/24/89

MISSION:
The ***WPCF Research Foundation*** is dedicated to advancing science and technology addressing water quality issues as they impact water resources, the atmosphere, the lands, and quality of life.

BACKGROUND:
The ***WPCF Research Foundation*** is concerning itself with a broad perspective of environmental and health issues and establishing its interests with regard to emerging as well as existing environmental and health challenges. With its principal focus on water quality, the ***Foundation*** must be perceptive in its recognition of the causes of water pollution; articulate in its understanding of the causes and consequences; and explicit in its pursuit of environmental improvement and pollution prevention.

Foundation responsibilities go well beyond the traditional interests in municipal and industrial water pollution control. The ***Foundation*** must concern itself with the increasing spectrum of activities listed below which impact water quality. The ***Foundation*** must also be concerned with the evolution of legislation, regulations and remedial programs dealing with water quality. The challenge to understand the systems relationships that exist between pollution causes, effects, remedial actions and related consequences is a primary objective of the ***Foundation.***

The ***WPCF Research Foundation's*** research needs fully recognize this breadth of interests and responsibilities. The ***Foundation*** is charting a course for research that maintains a leadership role and contributes significantly to meeting the nations environmental and health needs.

The ***WPCF Research Foundation*** exists to fulfill a commitment to responsible environmental stewardship. Our research program is designed to ensure continuity and coordination, stringent peer review, focus and vision which will lead to the ultimate fulfillment of our mission.

RESEARCH TOPICS:
The ***WPCF Research Foundation's*** policy and procedures require its Research Council to develop a comprehensive Five Year Plan and an Annual Research Agenda. Both of these documents are animated by the ***Foundation's*** mission and the vision of its Board of Directors. What follows are research needs as identified by the ***WPCF Research Foundation.*** These needs fall into three general areas which are not mutually exclusive:

(1)

MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT TECHNOLOGY

******Optimization of municipal & industrial wastewater treatment system performance* - Improvements in design, process monitoring and control strategies will be required, as well as refinement and incorporation of dependable on-line instrumentation and automation hardware. Advancements should also be sought for applied control algorithms, real-time evaluation and diagnostic procedures, hardware maintenance techniques, and troubleshooting strategies. Enhanced operator capability is an essential counterpart.

**Fate and reduction of toxic chemicals in wastewater treatment systems* - Control and reduction of toxic chemicals is a highly complicated and important subject, particularly given the diversity and site-specific variability of these compounds. Future research on this subject should focus on several complementary aspects, including: toxic characterization, biodegradation, bioconcentration, co-metabolism, modification, physico-chemical alteration, toxicological impact, and minimization of toxic substance problems associated with wastewater treatment operations.

**Pretreatment* - The pretreatment of industrial wastes prior to their discharge into municipal treatment facilities or direct discharge is essential in the control of toxic substances both in effluent and in the sludges. Research is needed to improve pretreatment processes, increase in-plant recycling, and improve monitoring. Additionally, research is needed to avoid adverse impact on other media in the disposal process.

**Improvements in wastewater collection systems* - The aging condition of the nation's wastewater collection systems raises concerns over very large long term capital needs as well as environmental concerns over their integrity as components of an environmental management system. Methods for control of odors and sulfide generation need to be refined and new methods developed. Rehabilitation techniques applicable to a broad range of materials and installation conditions need development. Both infiltration and exfiltration have negative environmental impacts and improved methods of control need development.

**Fate of volatile organic compounds* - Research on this topic should be directed toward the following important aspects: appropriate measurement procedures, environmental impact and contributory factors, detrimental system attributes, atmospheric fate, abatement procedures, health risks, and affiliated safety concerns.

**Wastewater disinfection* - Several research opportunities have been projected in the general area of wastewater disinfection relative to the delivery and efficacy of alternative halogen chemicals and the technology and practicality of non-halogen methods, as well as impacts on receiving waters.

**Wastewater nutrient removal* - Additional research appears needed on physicochemical and/or biochemical procedures for nitrogen and phosphorus removal from wastewater. The critical needs in this regard include the consolidation of appropriate design criteria for alternative nutrient removal procedures, cost-effectiveness information on all such mechanisms and the development of case-study reviews.

**Optimization of wastewater treatment personnel performance* - Particular emphasis should be given to the following concerns: employee education needs, operator certification mechanisms and incentives, occupational safety, acute and chronic medical risks, and operator exposure to and contraction of communicable diseases, and enhanced capability to optimize treatment performance.

**Small wastewater treatment systems* - Research is required to address the growing demand for low cost treatment facilities with design flows of less than 1.0 mgd. It is estimated that 90% of new plant construction by the year 2000 will be in this size range and new tools are needed to produce reliable, low-cost treatment within this flow range.

**Attached growth system* - Research in this area shows considerable promise for achieving space and cost reductions. Extended, full-scale evaluation is required.

**Secondary clarification* - The research needs inherent to clarification range from a fundamental analysis of particle-fluid interaction phenomenon to pragmatic design criteria for optimal particle flocculation and sedimentation.

**Wastewater systems* - Research is needed to deal with the sequence of relationships that exist between sources of wastewaters, collection works, treatment works and processes, residuals disposal and management, receiving water impacts, and impacts on downstream water uses as a "system" of relationships capable of being modeled and dealt with in the aggregate when evaluating alternatives for more effective, less costly wastewater management.

(2)

RESIDUALS MANAGEMENT

**Sludge management* - The development of beneficial options for ultimate residue disposal and the characterization of sludge properties and behavior are critical study areas. Improvements in treatment technology both for final disposal and beneficial usage are also needed.

**Hazardous waste management* - The important issue of hazardous waste management warrants future research emphasis relative to both current operation (in terms of generation, transportation, treatment, and final disposal of hazardous waste) and previously contaminated sites (in terms of evaluation, assessment, and clean-up activities).

(3)

WATER QUALITY EFFECTS

**Groundwater* - The primary objective of controlling toxic substances is protection of groundwater. Future research needs under this topic include groundwater movement and recharge, lagoon lining, and correctional measures for contaminated groundwater.

**Biomonitoring* - Although biomonitoring tests are quickly becoming a standard analytical requirement for wastewater treatment facilities, several areas of concern have yet to be resolved, including: selection of single or multiple test species, cost-effectiveness of the tests, quality control procedures and stipulations, testing frequency, statistical verification, correlation of analytical results, and testing protocols.

**Water reuse* - Two research needs are evident in the area of wastewater effluent reuse, including: development and validation of technical procedures and mechanisms for water conditioning requirements; and identification, characterization, and assessment of health risks stemming from reuse practices within agricultural, industrial, and domestic systems.

**Nonpoint source pollution contaminant control* - Future research efforts should be focused on the abatement of contaminant runoff from industrial, urban, rural, agricultural, and commercial non-point sources, as well as calibrating the relative impact and fate of these materials.

**Receiving water studies* - Research is needed to develop more accurate modeling of the environment's ability to assimilate wastes.

Realizing that radical innovations could surface at any time, and that research needs will change, the ***Foundation's*** planning process considers unsolicited proposals and will continue to examine future needs which address the mission of the ***WPCF Research Foundation.***

WPCF RESEARCH FOUNDATION

1990 RESEARCH AGENDA

AGENDA SETTING ASSESSMENTS

AGENDA SETTING ASSESSMENTS

At the January 19, 1990, meeting of the WPCF Research Foundation Board of Directors, five Agenda Setting Assessment (ASA) projects were advanced by the Foundations Research Council and approved by the Board. These ASAs are introduced in response to needs identified by municipal wastewater facilities. The ASAs will provide useful information to wastewater utilities in the short term, while achieving a critical review which will provide promising direction for future research in the five subject areas. The assessment procedure to be followed for all five projects is outlined below. The specific ASAs, and a brief description of each, follow.

ASSESSMENT PROCEDURE

TASK I—CRITICAL LITERATURE REVIEW:

A principal investigator is selected to conduct a thorough critical review of existing knowledge in the subject area. Where existing reviews are available, they will be adopted or extended through supplemental report preparation. This review is scheduled to span approximately four months and shall include a thorough review of recent and current municipal projects and experience. The preliminary report shall include both a critical review of existing knowledge and a draft research agenda aimed at addressing the most promising avenues of research to pursue. A Project Subcommittee of five to ten individuals is formed to meet with the principal investigator to provide initial direction.

TASK II—ESTABLISH RESEARCH PRIORITIES:

The Project Subcommittee reviews the critical literature review and draft research agenda. Using a facilitator, municipal representatives and a panel of recognized experts in the specific subject area interact to review and critique the critical literature review and draft research agenda. The municipal representatives and panel of experts will also suggest alternate research agenda items and prioritize them through consensus building methods. Some, and possibly all, of these meetings will be conducted as pre-conference workshops at the October, 1990, WPCF Annual Conference in Washington, DC. These workshops will be free to WPCF Research Foundation Subscribers with a fee being assessed to others.

TASK III—REPORT PUBLICATION:

The critical literature review and research priority document is revised in accordance with the consensus reached during the workshop described in Task II above and published. Task III is scheduled to be completed within six weeks of the workshop.

AGENDA SETTING ASSESSMENT PROJECTS

TRANSPORT AND FATE OF TOXICS IN WASTEWATER TREATMENT FACILITIES:

This assessment will assist wastewater treatment system (collection systems and plants) operators in responding to recent and proposed requirements to report on toxics released to the environment (all media). Mechanistic models have been built to describe transformation processes in portions of the system and, in some cases, multiple models are available. This assessment will compare the quality of available models, identify any gaps, and identify and prioritize areas for additional research support.

VOC VAPOR PHASE CONTROL TECHNOLOGY ASSESSMENT:

While hydrocarbon emissions from wastewater treatment facilities tend to be low in proportion to urban emissions from other sources, it is probable that wastewater treatment facilities will need to comply with more restrictive discharge standards with regard to these emissions in the near future. Existing emission control technologies have largely been developed for odor control, and little is known about the effectiveness of conventional or innovative technologies in controlling specific organics. This assessment will survey available data and identify research on promising technologies.

AQUATIC BIOLOGICAL RISK ASSESSMENT:

Aquatic biological risk assessments used to set water quality standards have not been developed to sufficiently assist environmental managers in determining a regulatory framework, prioritizing projects, and allocating resources. Available ecological risk assessment techniques will be compared and assessed, and areas needing further research or protocol development will be identified.

SLUDGE PROCESSING AND DISPOSAL—INNOVATIVE PROCESS ASSESSMENT:

Sludge processing and disposal options are decreasing while the mass of sludge generated is increasing yearly. A worldwide search of innovative sludge treatment, disposal, and reuse processes will be made and the research critically evaluated. Processes deserving of further developmental research will be identified. A baseline will be established by comparing their cost and/or performance advantages to conventional processes.

NON-POINT SOURCE IMPACT ASSESSMENT:

In spite of significant improvements in effluent quality at wastewater treatment facilities, continued degradation of receiving waters places increased concern on the effect of non-point sources of pollutants. The municipal stormwater discharge permitting process is one example of non-point source discharges being regulated, while little is known about the cause/effect relationships. This assessment will identify research needs in the technology of non-point source impact assessment.

WPCF Research Foundation
WATER POLLUTION CONTROL FEDERATION
RESEARCH FOUNDATION

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STATEMENT OF

MR. BILLY TURNER

PRESIDENT, COLUMBUS WATER WORKS
COLUMBUS, GEORGIA

ON BEHALF OF THE

WATER POLLUTION CONTROL FEDERATION (WPCF)

RESEARCH FOUNDATION

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES

HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE

OVERSIGHT HEARING ON THE 1987 WATER QUALITY ACT

March 22, 1990

Good morning, I am Billy Turner, President of the Columbus Water Works in Columbus, Georgia. One of my primary responsibilities as President is to provide for the treatment of municipal and industrial wastewater at the Publicly Owned Treatment Works (POTW) in Columbus. I have also served on the American Water Works Association Research Foundation's Research Advisory Board, and currently sit on the Water Pollution Control Federation (WPCF) Research Foundation's Board of Directors. My facility in Columbus was the first to financially support the WPCF Research Foundation.

The populations served by individual POTWs vary from a few hundred to millions. Columbus could be characterized as a typical medium sized facility, treating an average of some 35 million gallons of wastewater every twenty-four hours. Like every other facility in this country, we are called upon to protect the public and environmental health by providing pollution control in the most cost effective manner feasible.

This charge is becoming a greater challenge every day. Both state and federal regulatory agencies are implementing more restrictive effluent standards. In order to meet these standards, individual municipalities must invest whatever resources necessary or face stiff penalties. I am not here to debate the regulatory atmosphere in this country, but to convey the dilemma municipalities face.

Using sludge disposal as an example, environmental regulations on sludge reuse and disposal are becoming more restrictive, and therefore, more expensive. The volume of sludge being produced is becoming greater, and the options for disposal fewer. The debacle the nation watched the City of Baltimore experience with their "Poo-Poo Choo-Choo" late last year is typical of this nations sludge disposal problems.

Short term answers to problems like sludge disposal involve simply moving it around. For example, instead of ocean dumping, a municipality might deposit their sludge in a landfill. Another option is incineration of sludge, but it is not clear what the long term effects of incineration are. The state of technology and current scientific knowledge tells us that these are only short term answers.

Our city, along with Chicago, Atlanta, San Francisco, New York, Akron, Milwaukee, Salt Lake City, Seattle, Virginia Beach, and others are supporting the WPCF Research Foundation because no single municipality has the resources necessary to tackle the comprehensive research agenda necessary to find answers to critical environmental problems we all face. The WPCF Research Foundation offers municipalities an opportunity to pool our limited resources. It also provides an administrative mechanism ensuring the common needs of the industry will be met, and that the emphasis will be on practical, applied research.

The subscription based funding mechanism described by Dr. Schwartz will provide the WPCF Research Foundation with a long term, stable source of funds through which it will endeavor to assist municipalities in providing environmental stewardship. However, my experience working with the American Water Works Association Research Foundation tells us it will take two or three years before sufficient numbers of municipalities can be approached, and approval for funding secured from their governing bodies.

For this reason, it is crucial that Congress act favorably upon the WPCF Research Foundation's request for a $2.5 million cooperative grant through EPA, and that this subcommittee advance authority for the creation of a pilot program providing a match of research funds from the wastewater industry in a ratio of 1 to 1.

STATEMENT OF
CONSTANTINE SIDAMON-ERISTOFF
REGIONAL ADMINISTRATOR, REGION II
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON WATER RESOURCES
HOUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

March 22, 1990

Good afternoon. I am Constantine Sidamon-Eristoff, Regional Administrator of the U.S. Environmental Protection Agency, Region II. Our Region includes the States of New York and New Jersey, Puerto Rico and the U.S. Virgin Islands. I am pleased to be here today to discuss EPA's activities regarding Onondaga Lake, New York, and the efforts underway to restore the lake.

Onondaga Lake is 4.5 square miles in size and drains northward into the Seneca River, a tributary of the Oswego River, which ultimately empties in to Lake Ontario.

Land use around the lake exhibits striking contrasts. State and county parks encircle the northern and northeastern sections of the lake. Industry, including the extensive Allied Chemical waste beds, is concentrated in the southern and southwestern portion. The City of Syracuse lies along the southernmost portion of the lake.

Currently the lake is not attaining the fishable/swimmable goal as mandated by the Water Quality Act of 1987 (the Act).

Swimming is not permitted in the lake due to turbidity and high bacterial concentrations. As a result of bioaccumulation of mercury in the lake's fish, the New York State Department of Environmental Conservation (DEC) issued an advisory against the consumption of fish caught in the lake in 1970. In 1986 the ban was lifted to allow "catch and release" fishing, but the advisory not to eat fish remains in effect.

The lake, which is not a drinking water supply because of its salinity, is highly eutrophic. The excessive phosphorus levels and resultant phytoplankton blooms persist despite a ban on phosphorus detergent, which has been in place for several years.

Since the late nineteenth century, Onondaga Lake has been affected by various pollutants. Some of the major sources of pollution in the lake have been the Solvay soda ash plant; the Allied Chemical coal tar extraction facility; the Oil City tank farms; the Syracuse Metro Sewage Treatment Plant; and numerous combined sewer overflows. Despite the 1986 shut-down of Allied Chemical, leachate from its Solvay process waste beds continues to affect the lake. In addition the lake has been affected by mercury contamination of the sediment which is the result of past industrial waste disposal methods. The mercury contamination of the sediment has resulted in the placement of Onondaga Lake on the New York State Department of Environmental Conservation (DEC) Register of Inactive Waste Sites.

DEC did complete an extensive investigation of the sediment contamination to determine the Federal Hazard Ranking System score for possible inclusion on the Superfund National Priority List (NPL). As a result of this investigation, the lake did not receive a high enough score to be included on the NPL. Therefore, at the present time, there is no direct Federal Superfund involvement in the lake. The State of New York in June 1989 filed an action against Allied Chemical seeking remediation and damages. The State also issued two Administrative Orders on Consent for Remedial Investigation and Feasibility Studies for most of the area immediately surrounding the lake and is negotiating a third party consent order for a specific Allied facility near the lake. Normally EPA does not monitor such State enforcement activities. However, because of significant interest in the lake, EPA is monitoring the State's progress to determine whether there is need for Federal involvement. In this regard on December 13, 1989, the State indicated that due to its enforcement activities, legal action by EPA would not be needed or beneficial.

Under the Clean Water Act, EPA and New York State have concurrent enforcement authorities and EPA will continue its ongoing coordination with New York State in these enforcement efforts. EPA will continue to review the performance of municipalities and corporations on or near the Lake to assure compliance with the Clean Water Act.

The Environmental Protection Agency, since its inception, has been involved, through the State, in the efforts to restore Onondaga Lake. A total of over $225 million dollars in Federal funds was awarded between 1957 and 1988 towards sewerage projects in the Onondaga area. $215 million of these funds were awarded since 1970, when EPA became an independent agency. The construction grants program has, over the years, reduced the raw sewage loadings into the lake and thus reduced somewhat the bacterial contamination, nutrient levels, and biochemical oxygen demand loadings. There are still significant combined sewer overflow loadings to the lake.

EPA also provided funding in 1976 and 1980 under Section 208 of the Clean Water Act. These funds enabled the Central New York Regional Planning and Development Board (CNYRPDB), the designated 208 water quality management planning agency, to develop a water quality management plan for the area. The plan was certified by the State in 1981 and approved by EPA. It identified the programs necessary for point source controls, management of nonpoint source pollution, and the institutional and legislative needs to restore and maintain the lake. The 208 program identified the need for a more comprehensive management plan and method for coordinating the pollution control programs.

Since 1983, EPA has provided funding to the NYSDEC under Section 106 and 205(j) grants to implement the activities in the State workplan for the Onondaga area. In 1986, using these funds, the State funded the CNYRPDB to develop a preliminary lake and watershed management plan. Once completed, it was determined that additional work was needed to develop specific recommendations. Presently, using DEC and EPA funds, the CNYRPDB has undertaken a program to perform this work, expected to cost over $1.4 million dollars - about $552,000 is EPA Section 205(j) money. Additional EPA monies are being passed through by the State to the Planning Board under the authority of Section 314 of the Clean Water Act, as amended.

In 1989, the State applied for Section 314 Clean Lakes funding to perform a Phase I diagnostic/feasibility study of the lake to complement the work already underway. As required by EPA, the State submitted a priority list with its seven applications. The Onondaga Lake project was placed fourth on this priority list, which was not high enough to receive funding. However, the Conference Report for the fiscal year 1990 EPA appropriations bill provided $500,000 for a Management Conference for Onondaga Lake. The language of that provision read "[T]he conference shall develop a plan that identifies corrective action and compliance schedules for clean up, and coordinates implementation of the plan by members of the conference and others." A further purpose of the Management Conference is to serve as a coordinating body for all other ongoing lake cleanup work, to ensure that each work item is consistent with the management plan and with each other and is not duplicative. The EPA Region II Office recently received the formal grant application for the Clean Lakes funds from the State on March 13, 1990, and will submit it to EPA - Headquarters for approval. Once HQ provides a commitment notice, the Region can process the grant and award the funds to the State.

The Management Conference members include EPA, the Governor of the State, the Army Corps of Engineers, the State Attorney General, Onondaga County, and the City of Syracuse. The conference is being structured generally along the lines of the EPA National Estuary Program, and includes both scientific and citizen committees.

The Management Conference was convened for the first time on February 14th in Syracuse. Our opening session was presided over by Senator Moynihan and Representative Walsh. Governor Cuomo attended and stated New York State's strong backing for the Conference, as did representatives of the City and County, as well as General Patin of the Corps of Engineers.

As EPA's representative, designated by William Reilly, I stated that the cleanup of Onondaga Lake is a high priority for EPA. I added that the Conference will be very much a cooperative venture involving all three levels of government. I endorsed the need for strong involvement by the public and by the scientific and academic communities in the process. I also pointed out that EPA is already working cooperatively with New York State on enforcement activities related to lake cleanup, and that we have agreed the State will assume the lead on these activities.

The second meeting of the Management Conference was held on March 16th and the agenda included the status of conference funding, a discussion of staff, confirmation of the job description and salary for the management conference's executive director, appointments to the technical advisory group, a report on the status of appointments to the citizens advisory committee, and an update from the ongoing Corps of Engineers' reconnaissance study.

I appreciate the opportunity to discuss the EPA's views on Lake Onondaga. The clean up of Lake Onondaga will be a technically difficult and lengthy process which must be carefully and deliberately thought through.

I would be pleased to answer any questions you might have.

TESTIMONY OF NORMAN SPIEGEL, ASSISTANT ATTORNEY GENERAL OF NEW YORK, ON BEHALF OF ROBERT ABRAMS, ATTORNEY GENERAL OF THE STATE OF NEW YORK, BEFORE THE SUBCOMMITTEE ON WATER RESOURCES

Mr. Chairman and members of the Subcommittee, thank you for the opportunity to appear on behalf of Robert Abrams, the Attorney General of the State of New York to give testimony concerning the pollution and cleanup of Onondaga Lake. Attorney General Abrams regrets the fact that he was unable to attend today and has asked me to convey his personal appreciation for the opportunity to testify in favor of this important legislation.

In offering the Attorney General's support for the concept of the Onondaga Lake Management Conference, I would like also to explain the State's efforts to force, through litigation, those responsible for the most serious pollution of Onondaga Lake to clean it up. This would give the committee a more complete picture of our ongoing efforts to restore the Lake as an environmental resource.

On June 27, 1989 the Attorney General, on behalf of the State of New York, filed suit in the United States District Court in Syracuse, New York against Allied Signal, Inc. as the most significant contributor of industrial wastes to the Lake. The action seeks to compel the company to repair the damage its pollution has caused and pay for losses to the State's natural resources. Allied Signal's liability is predicated upon the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and

Reauthorization Act (SARA), the New York Environmental Conservation Law and the State's common law of public nuisance. In short, the purpose of the suit is to seek redress for a century of indiscriminate dumping of industrial wastes.

The complaint charges that starting in 1884 and continuing through 1986, Allied Signal and its corporate predecessors in interest engaged in the manufacture of chemicals at a huge industrial complex located near the southwestern shore of Onondaga Lake. The complaint claims that Allied Signal disposed of the waste products of its chemical manufacturing operations by dumping, spilling and discharging such wastes into Onondaga Lake and its tributaries and onto land areas which drain into Onondaga Lake. These wastes include mercury, chlorinated benzenes and alkali wastes such as calcium carbonate, chloride and sodium. Today the land areas where Allied Signal disposed of its wastes cover over 1500 acres with the waste materials rising as high as sixty feet into the air. A study conducted in 1989, two years after Allied ceased manufacturing activities at this facility, indicates that in excess of 400 tons of chloride a day continue to enter Onondaga Lake through the migration of groundwater contaminated with Allied's wastes. This amount represents only a fraction of the waste discharged to the Lake daily over the 100 year period when Allied was engaged in active operations and waste disposal.

It is also estimated that from 1947 to 1979, Allied Signal discharged approximately 165,000 pounds of mercury, a hazardous substance, into Onondaga Lake and its tributaries, contaminating the sediments of the Lake. In fact, the sediments of Onondaga

Lake are so contaminated with mercury that the lake bottom has been placed on the State's Registry of Inactive Hazardous Waste Disposal Sites.

Allied also discharged large quantities of chlorinated benzenes to areas in close proximity to Onondaga Lake. A viscous swamp of tar highly contaminated with hazardous substances, now covers a 22 acre area.

The staggering consequences of these waste disposal activities are enormous. The fish in Onondaga Lake are unfit for human consumption because they are contaminated with mercury. The lake bottom is covered by a layer of calcite (calcium carbonate) as much as four feet thick which has severely damaged the littoral zone of the Lake and otherwise damaged the Lake's fishery. Allied's disposal of wastes into the Lake has also contributed to conditions which make swimming unsafe.

Due to the complexity of the Lake ecosystem and the volume and variety of chemicals disposed of in the Lake, development of a comprehensive cleanup program will be no easy task. In general, in any CERCLA litigation the law requires the cleanup effort to comply with the procedures set forth in the National Contingency Plan (NCP), 40 CFR Part 300. The NCP and analogous State regulations require as a first step the preparation of a Remedial Investigation and Feasibility Study (RI/FS). A Remedial Investigation is a comprehensive data gathering program to evaluate conditions at the site. The Remedial Investigation is intended to provide sufficient data to evaluate, select and design a remedial program. The Feasibility Study evaluates the various treatment technologies and combinations of such technologies in terms of their ability to protect public health and the environment and attain appropriate cleanup levels. The FS can include pilot studies and bench tests of various remedial alternatives to determine their effectiveness. On average, an RI/FS takes two and one half years from the time the work is actually begun until completion. The study and remediation of Onondaga Lake will be a far more complex undertaking than the "average" inactive hazardous waste site, e.g. a landfill, and consequently we can anticipate a more time consuming process.

Once the RI/FS Report is finalized, the State must select the most appropriate remedial program for the site. The decision making process provides for public comment, and, when the matter is the subject of litigation, for the review and approval of the court. Once a remedial alternative is approved the remedial program proceeds with the development of design specifications and actual construction.

In approaching the study and remediation of an inactive hazardous waste site the State has available two basic options. To the extent that monies are available, the State can contract with appropriate consultants, engineering and construction firms to perform the RI/FS and/or implement the selected remedy. The State would then seek to recover through litigation the costs of such work from the responsible party. In the alternative, the State and the responsible party, in this case Allied Signal, can, in the context of the litigation, enter into consent orders whereby the work is performed by the company's consultants and engineers under strict State oversight. As a result of the State's lawsuit, the State and Allied Signal are presently engaged in negotiations with respect to the possibility of Allied Signal funding the performance of the RI/FS.

It should be kept in mind, however, that Allied is not the only entity responsible for the contamination of the Lake. In addition to our litigation against Allied Signal, on December 21, 1989 the State concluded an agreement with the LCP Chemical Company, a/k/a Hanlin Group, Inc., which settled a portion of that company's liability for contributing to the contamination of Onondaga Lake. As part of the agreement, LCP financed a conference of scientists and engineers with expertise in areas related to the Onondaga Lake ecosystem and its remediation. The conference, which was organized by New York State, was held in upstate New York in February 1990 and included a group of thirty-four scientists and engineers from around the world, in addition to the State's technical experts. The participants came from academia, government and private research and consulting firms and from Sweden, France and Canada. Their disciplines included chemistry, aquatic ecology, biology, geochemistry, geology, engineering and mathematics. The participants met for three full days in five working groups, as well as in plenary sessions and addressed a host of issues related to the cleanup of Onondaga Lake. We are very satisfied with the results of the conference and we expect to have a proceedings document available in the near future. We anticipate that the results of the conference will be extremely helpful in developing the RI/FS for Onondaga Lake.

In 1988 New York State also reached a settlement with Onondaga County to pay for a $525,000 study of pollution of Onondaga Lake and to undertake extensive improvements in its sewage treatment facilities.

As evidence is developed, we may, of course, pursue other responsible parties to the extent that they still exist and are financially viable. There remains, however, the likelihood that despite our best legal efforts, not all of the environmental problems associated with the Lake will be amenable to the judicial process. Nor is there any assurance that the judicial process will provide relief in a timely manner particularly if the responsible party is uncooperative. Consequently, we will need to look to other resources to complete the restoration of the Lake. This is why the management conference and the funding provided by this legislation is so important.

We congratulate Senator Moynihan and Congressman Walsh for establishing the Onondaga Lake Management Conference and providing funds toward the study and remediation of the Lake. We are looking to the management conference to assist with the coordination necessary to ensure that various studies and remedial efforts undertaken by governmental and private entities are not duplicative and do not work at cross purposes. The conference should also provide assistance by recommending various remedial approaches. Perhaps most important of all, funds made available by this legislation could be used to support environmental studies necessary to the ongoing effort to force those responsible for the contamination to clean up the Lake and to address portions of the Lake's environmental problems which are not resolved through the judicial process.

Onondaga Lake is the victim of over 100 years of environmental abuse. It will take the combined and coordinated efforts of the State, Federal, County and Municipal governments to restore the Lake as an environmental resource. We thank you Congressman Walsh and Senator Moynihan for your leadership at the Federal level. And I thank you Congressman Novak and the other members of the Subcommittee for this opportunity to present our views on this matter.

MDA

TESTIMONY BY CHRISTOPHER L. SPIRE
SYRACUSE PARTNERSHIP COMMITTEE
ON ONONDAGA LAKE

CHAIRMAN NOWAK, CONGRESSMAN WALSH, I AM CHRISTOPHER L. SPIRE, A MEMBER OF THE SYRACUSE PARTNERSHIP COMMITTEE ON ONONDAGA LAKE, AND PLANT MANAGER OF THE ANHEUSER-BUSCH FACILITY LOCATED IN BALDWINSVILLE, NEW YORK. WILLIAM J. DONLON, CHAIRMAN OF THE SYRACUSE PARTNERSHIP COMMITTEE REGRETS THAT HE IS UNABLE TO ATTEND AND ASKED THAT I REPRESENT HIM AT THIS HEARING.

THE SYRACUSE PARTNERSHIP CONSISTS OF THE ONONDAGA COUNTY EXECUTIVE, THE MAYOR OF THE CITY OF SYRACUSE, THE CHANCELLOR OF SYRACUSE UNIVERSITY AND THE FOUR TOP OFFICERS OF THE METROPOLITAN DEVELOPMENT ASSOCIATION, REPRESENTING THE BUSINESS LEADERSHIP OF THE CENTRAL NEW YORK COMMUNITY.

THE PURPOSE OF THE PARTNERSHIP IS TO IDENTIFY AND AGREE ON KEY COMMUNITY PROJECTS AND ISSUES WHICH WILL BENEFIT FROM THE CONCERTED ATTENTION OF THIS GROUP. THE BUSINESS COMMUNITY HAS JOINED WITH CITY AND COUNTY GOVERNMENT TO BRING TOGETHER THE TOTAL RESOURCES OF BOTH THE PUBLIC AND PRIVATE SECTORS IN ADDRESSING AND SOLVING MAJOR PROBLEMS OR CAPITALIZING ON MAJOR OPPORTUNITIES FOR CENTRAL NEW YORK.

THE SYRACUSE PARTNERSHIP HAS SELECTED AS ITS HIGHEST PRIORITY, THE CLEAN-UP AND RESTORATION OF ONONDAGA LAKE. AS MDA DIRECTORS, BILL DONLON AND I LEAD A COMMITTEE OF THE SYRACUSE PARTNERSHIP COMPRISED OF MAJOR COMMUNITY LEADERS AND REPRESENTATIVES FROM THE ONONDAGA LAKE ADVISORY COMMITTEE. THIS SYRACUSE PARTNERSHIP COMMITTEE HAS ACCEPTED THE RESPONSIBILITY AND IS PREPARED TO DO WHATEVER IT TAKES TO ASSIST IN ANY AND ALL ASPECTS OF RESTORING AND PROPERLY MANAGING ONONDAGA LAKE.

THE MISSION AND PURPOSE OF THE SYRACUSE PARTNERSHIP COMMITTEE IS AS FOLLOWS:

1. WORKING IN CONCERT WITH THE RECENTLY APPOINTED ONONDAGA LAKE MANAGEMENT CONFERENCE, THE COMMITTEE WILL BRING TOGETHER AND FOCUS THE EFFORTS OF THE MANY GROUPS, ORGANIZATIONS AND AGENCIES THAT HAVE AN INTEREST IN RESTORING ONONDAGA LAKE.

2. THE COMMITTEE WILL RECOMMEND AND TAKE WHATEVER ACTION IS NECESSARY TO SECURE REQUIRED STATE AND LOCAL MATCHING FUNDS TO BE COUPLED WITH THE CONSIDERABLE INVESTMENTS, BOTH PUBLIC AND PRIVATE, ALREADY MADE, TO MATCH THE FEDERAL ASSISTANCE PROVIDED FOR IN THE PENDING LEGISLATION.

3. THE COMMITTEE WILL CAUSE THE PREPARATION OF A COMMUNITY LAND USE MASTER PLAN FOR THE LANDS SURROUNDING

ONONDAGA LAKE. THIS UTILIZATION PLAN WILL ULTIMATELY BE SUPPORTED BY THE APPROPRIATE ENABLING AND ENFORCING LEGISLATION AND ADOPTED AS THE COMMUNITY'S MASTER PLAN FOR ONONDAGA LAKE AND ADJACENT AREAS.

TO DATE, SOME DEGREE OF PROGRESS HAS BEEN MADE ON EACH OF THESE OBJECTIVES. COMMITTEE MEMBERS HAVE MET WITH LOCAL GOVERNMENT OFFICIALS, STATE ENVIRONMENTAL REPRESENTATIVES, COL. BOYD AND HIS STAFF AT THE U.S. ARMY CORPS OF ENGINEERS, AS WELL AS LOCAL INTEREST GROUPS AND ORGANIZATIONS.

THE COMMITTEE ANTICIPATES MEETING WITH THE LOCAL STATE LEGISLATIVE DELEGATION IN THE NEAR FUTURE TO BEGIN DISCUSSIONS RELATIVE TO THE REQUIRED STATE/LOCAL MATCH PROVISION IN THE FEDERAL LEGISLATION.

AS BOTH COUNTY EXECUTIVE PIRRO AND MAYOR YOUNG HAVE INDICATED, FEDERAL PARTICIPATION IN THIS EFFORT IS CRITICALLY IMPORTANT IF WE ARE TO BE TRULY SUCCESSFUL. WITHOUT FEDERAL FUNDING ASSISTANCE, THE COMMUNITY WILL BE UNABLE TO ADDRESS THE MAJOR POLLUTION PROBLEMS IMPACTING THE LAKE; PRIMARILY COMBINED SEWER OVERFLOWS.

ALTHOUGH FEDERAL PARTICIPATION IS CRITICAL, WE RECOGNIZE AS A COMMITTEE AND AS A COMMUNITY, THAT WE CANNOT EXPECT THE FEDERAL GOVERNMENT TO BE SOLELY RESPONSIBLE FOR TURNING OUR PLANS TO

MDA

ACTION. AS I HAVE NOTED ABOVE, WE ARE PREPARED TO PUT INTO PLACE WHATEVER STATE AND LOCAL PARTICIPATION IS NEEDED, EITHER PUBLIC OR PRIVATE, TO MATCH THE AGGRESSIVE SUPPORT YOU ARE COORDINATING ON OUR BEHALF.

I BELIEVE ONE OF THE MOST IMPORTANT MESSAGES I COULD BRING TO YOU THIS MORNING IS THAT THE ENTIRE COMMUNITY IS BEHIND THIS EFFORT. ORGANIZATIONS, WHICH AT TIMES HAVE OPPOSING VIEWS, ARE JOINING FORCES ON THIS ONONDAGA LAKE PROJECT. WE HAVE A UNIQUE AND PERHAPS ONE-TIME OPPORTUNITY TO DO SOMETHING ABOUT THE LAKE -- IT IS AN OPPORTUNITY WE MUST NOT WASTE.

WE ALSO CLEARLY UNDERSTAND THAT THE PROCESS FOR RECEIVING FEDERAL ASSISTANCE WILL TAKE CONSIDERABLE EFFORT BUT WE ARE ENCOURAGED BY STEPS THAT HAVE ALREADY BEEN TAKEN, MOST NOTABLY THE APPOINTMENT OF THE ONONDAGA LAKE MANAGEMENT CONFERENCE AND APPROPRIATION OF FUNDS BY CONGRESS FOR BOTH THE MANAGEMENT CONFERENCE AND THE CORPS OF ENGINEERS.

WE ARE CONVINCED THAT THE AGGRESSIVE PROGRAM PROPOSED IN THE LEGISLATION WILL ULTIMATELY TRANSFORM ONONDAGA LAKE FROM A LIABILITY, AND QUITE FRANKLY A COMMUNITY EMBARRASSMENT, INTO AN INTERNATIONALLY RECOGNIZED SUCCESS STORY.

AS HAS ALREADY BEEN ELOQUENTLY STATED BY PREVIOUS SPEAKERS, THIS PROJECT IS IMPORTANT FROM BOTH AN ECONOMIC AND ENVIRONMENTAL

STANDPOINT. SIMPLY STATED, THIS IS THE SINGLE MOST IMPORTANT PROJECT THAT WILL LEAD OUR COMMUNITY INTO THE NEXT CENTURY.

FROM AN ENVIRONMENTAL PERSPECTIVE WE HAVE LEARNED THAT BENEFITS FROM THIS PROJECT WILL TRANSCEND THE IMMEDIATE BOUNDARIES OF ONONDAGA LAKE. SINCE WATER IN THE LAKE FLOWS NORTH REMEDIATION OF POLLUTION IN ONONDAGA LAKE WILL BENEFIT THE THREE RIVERS SYSTEM, AND ULTIMATELY LAKE ONTARIO - AN INTERNATIONAL BODY OF WATER. THEREFORE, FAR FROM BEING A LOCAL OR PAROCHIAL ISSUE EXPENDITURE OF FEDERAL FUNDS FOR ONONDAGA LAKE AS CALLED FOR IN THE LEGISLATION WILL HAVE FAR REACHING NATIONAL AND INTERNATIONAL BENEFITS.

FROM AN ECONOMIC STANDPOINT, ONONDAGA LAKE REPRESENTS A COMMUNITY RESOURCE OF UNTAPPED POTENTIAL. WITH CONSTRUCTION ALREADY UNDERWAY ON A MAJOR REGIONAL SHOPPING CENTER AT THE SOUTHERN END OF THE LAKE AND WITH PLANS FOR HOUSING, OFFICES AND AN INNER HARBOR, THE ECONOMIC DEVELOPMENT POTENTIAL CAN ALREADY BE DEMONSTRATED. THE COMBINATION OF CLEAN WATER AND A COMMUNITY MASTER PLAN FOR THE LAKE WILL ENSURE THAT ONONDAGA LAKE BECOMES THE FOCAL POINT OF THE ENTIRE CENTRAL NEW YORK REGION.

I SHOULD ALSO NOTE THAT THE EXPENDITURE OF PUBLIC DOLLARS FOR THE RESTORATION OF ONONDAGA LAKE WILL HAVE SUBSTANTIAL IN-KIND BENEFITS WHICH WILL IMPACT ALL PROPERTIES IN PROXIMITY TO THE

LAKE. THE SPIN-OFF EFFECT FROM THE UPGRADING OF THESE LANDS WILL BE OF MAJOR COMMUNITY-WIDE IMPORTANCE.

TO CONCLUDE, IT IS THE GOAL AND OBJECTIVE OF THE SYRACUSE PARTNERSHIP, WITH YOUR HELP, TO RESTORE ONONDAGA LAKE TO A CONDITION WHERE IT IS VIEWED AS A COMMUNITY ASSET RATHER THAN A LIABILITY.

THE REASONS FOR MOVING NOW ARE CLEAR AND COMPELLING:

- THE COMMUNITY IS UNIFIED AND ORGANIZED.

- THE PUBLIC AND PRIVATE SECTORS ARE PREPARED TO DO WHAT IS NECESSARY.

- ALREADY LOCAL GOVERNMENTS AND PRIVATE INDUSTRY HAVE INVESTED AN ESTIMATED $300 MILLION TO CORRECT PROBLEMS THAT HAVE CAUSED POLLUTION.

- THE ONONDAGA LAKE MANAGEMENT CONFERENCE HAS BEEN ESTABLISHED AND WILL ULTIMATELY REQUIRE SIGNIFICANT RESOURCES TO CARRY OUT THEIR RECOMMENDATIONS.

- WE HAVE AN OPPORTUNITY TO DEMONSTRATE THAT THE VARIOUS LEVELS OF GOVERNMENT AND THE PRIVATE SECTOR CAN IN FACT WORK AS PARTNERS AND ACCOMPLISH SOMETHING SIGNIFICANT--

SOMETHING THAT COULD SERVE AS A MODEL FOR OTHER COMMUNITIES ACROSS THE COUNTRY.

THE SYRACUSE PARTNERSHIP STANDS READY TO WORK WITH YOU. WE THANK YOU FOR YOUR EFFORTS AND OFFER OUR ASSISTANCE IN THIS MOST WORTHWHILE CAUSE.

THANK YOU VERY MUCH FOR THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY.

Water Pollution Control Federation

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STATEMENT OF

IRA L. WHITMAN, Ph.D., P.E.

PRESIDENT, THE WHITMAN COMPANIES, INC.

ON BEHALF OF THE

WATER POLLUTION CONTROL FEDERATION

BEFORE THE

SUBCOMMITTEE ON WATER RESOURCES

HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE

OVERSIGHT HEARING ON THE 1987 WATER QUALITY ACT

March 22, 1990

PRESIDENT
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Maitland, FL

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Quincalee Brown
Alexandria, VA

Good morning. I am Dr. Ira Whitman, President of the Whitman Companies, Inc., an environmental engineering consulting firm based in East Brunswick, New Jersey. I am here today as Chairman of the Government Affairs Committee of the Water Pollution Control Federation (WPCF), a non-profit technical and educational organization devoted to leadership and guidance in the preservation and enhancement of water quality. Founded in 1928, the Federation's 40,000 members include civil and environmental engineers, wastewater treatment plant operators and managers, scientists, and others working in state and local government, federal agencies, industry, academia, and private practice. These people are actively involved in implementing clean water laws and regulations, and are the ones who will be affected by new legislation.

My own experience extends from the public sector, where I was Administrator of the State of Ohio EPA during the 1970's, to the private sector, where my company currently consults on many water and hazardous waste matters.

By all accounts, water quality in the U.S. has improved dramatically over the last two decades as a result of the 1972 Clean Water Act. Over 88% of the nation's wastewater treatment facilities now provide the equivalent of secondary treatment.

Rivers and streams such as the Potomac, Hudson, Cuyahoga, and the Houston Ship Channel have all experienced a significant reduction in the amount of organic and chemical pollutants.

As we approach the next scheduled reauthorization of the Act, the role of the federal government in water pollution control is changing. The construction grants program, one of the most publicly visible parts of the federal water pollution control effort, is being phased out. The growing federal budget deficit has raised concerns that future water-related programs will be driven by budget considerations and not water quality needs. And, the budget deficit is contributing to an increasing disparity between federally-mandated water pollution control requirements and federal funding to help states and municipalities pay for them.

We must ensure that adequate resources are provided and appropriate mechanisms are in place to deal with our current and future water quality needs. The following are issues which WPCF believes should be given priority in the next round of Clean Water Act amendments:

1. Funding
2. Flexibility
3. Sludge
4. Combined Sewer Overflows
5. Non-Point Sources
6. Wetlands
7. Professional Education and Training

Funding

Wastewater treatment has received significant federal funding since 1972, and though we recognize the need to adequately fund other national infrastructure needs such as airports and highways, we must emphasize that the country's wastewater treatment needs are still significant.

WPCF recognized in the early 1980's that primary responsibility for funding wastewater treatment plant construction should be transferred from the federal government to state and local governments. In order to achieve a smooth and efficient transition from federal to state control, however, WPCF strongly supported the creation of the State Revolving Fund (SRF), which would be capitalized by the federal government. This funding would make it possible for a state to make loans to its own municipalities for wastewater treatment plant construction and other water quality projects. When these funds were paid back, the state could loan to another municipality.

The SRF program has not been implemented as quickly as was first hoped, and it remains to be seen whether it ultimately will be successful. One problem is that Congress has been unable to appropriate funds at the full level called for in the 1987 Water Quality Act. Under the Water Quality Act, Congress authorized $1.2 billion for the SRF program in FY89, $1.2 billion in FY90, $2.4 billion in FY91, $1.8 billion in FY92, $1.2 billion in FY93, and $600 million in FY94. However, less than $1 billion was appropriated in both FY89 and FY90, and the President's budget calls for only $1.6 billion in FY91. In addition, states were not able to transfer any money from their construction grants allotment to their SRF as envisioned under the '87 Act because of immediate and pressing needs.

Another problem is that EPA and the Office of Management and Budget created requirements that were not anticipated by the '87 Act. Some municipalities may choose not to participate in the program because of the burdensome regulatory requirements which have made the program unattractive. The costly requirements also make the SRF program an unrealistic funding source for smaller communities which do not have resources to meet the requirements.

Even if the SRF succeeds in providing the funding for wastewater treatment plant construction, there is growing concern within the WPCF membership that the fund will not be sufficient to finance the cost of complying with regulations like stormwater, sludge management, and combined sewer overflows that were spawned by the Water Quality Act.

To meet the expected shortfall, WPCF has identified several funding mechanisms which should be considered:

1. **User fees.** Water utility charges by and large do not reflect the true cost of the service and commodity provided. Having municipalities and utility districts impose such charges encourages conservation and provides additional revenue for municipalities to reinvest into the wastewater system. The principle that all who receive benefit must pay the costs should be strongly emphasized.

2. **Privatization.** This may be an option for fast-growing, medium-sized cities with large future wastewater treatment needs. Private firms can contract with the cities to build collector systems and treatment plants, thus relieving municipal governments from the need to raise the large up-front capital costs for these facilities. Examples of cities where privatization has been successfully implemented include Auburn, Alabama and Chandler, Arizona.

In order to make privatization a viable option, several drawbacks would have to be overcome. Many municipalities are reticent to give up control over what has historically been a government responsibility. Most states do not have laws which would enable municipalities to contract for their wastewater treatment.

Finally, facilities built with federal money are ineligible under federal law to be run by private corporations.

3. **Tax-exempt Bonds.** A new class of tax-free municipal bonds that would allow for tax-exempt financing of local environmental needs is a third alternative. Such bonds need to be exempt from the state volume cap and arbitrage rebate requirements imposed by the 1986 Tax Reform Act. These bonds could be used to build or upgrade publicly-owned treatment works (POTW's), waste disposal facilities, and water facilities. Legislation has been introduced in the Senate, S. 700, to authorize these bonds.

There is no one readily available solution to solve our wastewater funding needs. The best course of action will lie in promoting some combination of State Revolving Funds, municipal bonds, privatization, and user fees. However, the cost of complying with regulations issued by the federal government eventually may need to be met with renewed federal funding.

Flexibility

There is a strong need to build more flexibility into the current statutory requirements of the Clean Water Act. When properly utilized, flexibility and regulatory discretion allow for a much greater achievement of water quality goals. EPA must be allowed to fully utilize its professional scientific staff to make decisions which will improve water quality.

Regulations should be founded on water quality standards, technological standards based on the best available scientific information, and a realistic health-based approach. Lack of flexibility limits the options available for meeting the law, even when these options could make a substantially greater contribution to water quality.

For example, the Clean Water Act requires secondary treatment for all POTW's. However, implementing secondary treatment in cities like Boston may not improve receiving water quality to the extent that controlling combined sewer overflows could. But the law does not allow for the foregoing of secondary treatment in light of more pressing water quality problems. Another example is national pretreatment standards, which lack flexibility and do not allow municipalities to address particular local needs.

Statutory deadlines must be imposed, but should be realistic and take into account the resource and time constraints under which EPA and state and local governments currently operate. EPA must be given sufficient resources and the flexibility to meet environmental mandates.

Sludge

WPCF believes EPA's proposed sludge regulations mandated by Section 405 of the Clean Water Act are seriously flawed. Prior to their issuance in January 1989, WPCF met with officials from EPA to express this concern. Although EPA Administrator Lee Thomas decided to go forward with publishing the proposed rule, he did agree to an unusually long comment period. He also mandated that the proposed regulations be analyzed by a scientific peer review panel during this period. WPCF, along with the Association of Metropolitan Sewerage Agencies (AMSA) and others, subsequently helped to fund this peer review group to analyze the draft proposal.

The peer review group found EPA's sludge proposal to be based on inaccurate scientific data. The panel also indicated that if issued in current form, the beneficial use of sludge would be greatly restricted. The panel further said that EPA lacked the scientific capability to produce a sound sludge disposal regulation and strongly recommended that EPA accept outside scientific assistance. WPCF has been working with EPA on this matter since the end of the comment period.

The criteria for evaluating the adequacy of sludge for beneficial uses should be based on good scientific data and a reasonable health risk model. A peer-review process should be statutorily encouraged in other regulatory initiatives, and should occur before proposed regulations are issued.

Combined Sewer Overflows

Combined sewer overflows (CSO's) adversely impact water quality. However, it is unclear as to just how serious a threat they pose to water quality in every location, and the current regulatory regime proposed by EPA may therefore be headed in the wrong direction. Before moving forward, EPA needs to devote sufficient resources to developing a well thought-out regulatory program that considers all feasible solutions as well as the cost impacts.

These problems could be addressed through statutory guidelines. The current combined sewer overflow program has no specific statutory foundation and is primarily proceeding on the basis of a 1980 court decision which mandates that all combined sewer overflows are subject to a Section 402 National Pollution Discharge Elimination System permit. The lack of statutory guidance has compelled EPA to treat all combined sewer overflows equally. With over 15,000 discharge points in 1500 cities, the cost impact of the current approach will be tremendous unless action on combined sewer overflows is prioritized. Implementing a phased approach similar to that used for the proposed stormwater regulations would help. We believe Congress must allow EPA the discretion to prioritize combined sewer overflow abatement needs according to their impact on human health and water quality, as well as provide funding for the cost of compliance.

Congress also should be prepared to review the impending stormwater regulations. Because of the statutory deadline for having regulations in place, EPA may be proceeding without closely examining all aspects of the issue. There is also concern that the massive costs are not being considered and that the current strategy may not be cost effective. It is too early to evaluate the impacts of the regulations, but if these concerns are not addressed by EPA, Congress should be prepared to provide further guidance for controlling stormwater discharges in the next reauthorization bill.

Non-Point Sources

Emphasis needs to be given to instituting incentives and management practices aimed at substantially reducing contaminated runoff from agriculture, mining, and other activities. These rural non-point sources are having an adverse impact on water quality, especially on groundwater aquifers. Groundwater supplies the vast majority of water needs in rural areas, and once contaminated, groundwater is extremely difficult to restore.

Municipalities are being required to institute expensive new measures for controlling urban non-point runoff from combined sewer overflows and stormwater outfalls. Unless rural non-point sources are identified and controlled, the gains made in urban areas may be negated.

As the problems become clearer, we must be prepared to develop and implement control measures. The key will be to find a mechanism through which rural non-point dischargers bear a fair share of the costs for controlling these sources.

WPCF believes a new regulatory regime for controlling these substances is premature, however, as the exact nature and extent of the problem varies by locality. We must continue to accumulate accurate scientific data on this water quality area through government and private efforts. We must also implement and evaluate state Nonpoint Source Management programs mandated under Section 319. WPCF strongly supports full funding for this program, which has been severely underfunded in the past. Section 319 needs to be strongly emphasized as a priority program in the next Clean Water Act amendments.

Wetlands

Currently planned revisions to federal wetlands policy must take into account the effect on wastewater management.

Historically, POTW's have been located in wetlands because they needed to be near water bodies, and because the intrinsic value of wetlands was not recognized. Future wetlands policy must recognize that construction of new facilities and expansion of old ones will likely occur in wetlands.

The role of using wetlands for wastewater treatment must also be encouraged under federal law. Engineers and scientists are only now realizing the vast potential which wetlands hold for treating wastewater under site-specific circumstances.

Professional Education and Training

Perhaps no issue is more vital to the future of our ability to manage wastewater than education. Our educational system lacks a process to nurture young children with aptitudes and interest in science and math. The direct result of this is the declining interest among young adults in pursuing education and careers in the science and engineering fields. If this trend continues, we fear there will be a lack of trained professionals in the water pollution control field. Accordingly, Congress must emphasize the need for enhanced math and science education during the early school years.

In addition, we must educate the public on the need for sound environmental processes and programs at all levels of society. The role of scientists, engineers, and policymakers in managing our environment should be made clear. Congress should recognize, in all future environmental legislation, the role of the federal government in assuring adequate scientific and professional training so that the environmental programs mandated by law can succeed.

EPA must be given the resources to adequately carry out its job of providing technical assistance to state and local governments. Continuing educational seminars for water pollution control professionals and technology transfers are also important parts of EPA's educational mandate and should be continued. Many of todays' professional leaders in water pollution control were trained through federal grants and fellowships in the 1950's and 1960's. Congress must be prepared to fund the means for training and educating the next generation of environmental professionals.

Summary

We have come a long way in abating point source discharges of water pollution, and we need to find ways to protect the investment we have made. We are now faced with new challenges, such as controlling combined sewer overflows, stormwater, and agricultural runoff. Technological know-how and regulatory programs which rely on sound health assessment models and flexibility for achieving state goals must be developed to meet these challenges. We must also find ways to pay for future improvements, realizing that state and local governments have only a limited amount of financial resources.

WPCF is eager to work with Congress in developing solutions to our nation's water quality problems through the Clean Water Act and other water quality initiatives. The preceding testimony represents a consensus of issues which should be addressed, and WPCF is currently working to develop Federation-wide positions on solutions to these problems. We will be happy to provide members of the subcommittee with any future statements on the Clean Water Act which the Federation develops.

As a national leader in water pollution control, WPCF offers its technical expertise to you as an objective resource on which to base sound federal water pollution policy. We believe that it is better to develop and implement good legislation and regulations to begin with than try to retroactively correct bad ones. We look forward to working with the subcommittee in the future on these issues, just as we continue to work with EPA.

This concludes my testimony. Thank you for the opportunity to come before you. I would be happy to answer any questions you may have.

OFFICE OF THE MAYOR

Thomas C. Young, Mayor

HR 2068

Mr. Chairman, members of the committee, I am honored to have this opportunity to speak on behalf of S27, "The Onondaga Lake Restoration Act." I am Thomas C. Young, Mayor of the City of Syracuse.

The story of Onondaga Lake begins as a Great American Saga, with the proud Onondagas of the Iroquois Federation having their first encounter with Europeans--Jesuit missionaries--on its shores. Later, a single enterprising trapper named Ephraim Webster settled in the Onondaga Creek inlet. He told customers near Albany about the salt wells around the lake, and that started the first industry for which Syracuse was to become world famous.

Typical of American stories, this one has a grand epoch of industrial expansion during the days of the Erie Canal, but the tale ends with the sad moral that uncontrolled progress can be a cruel hoax. And this admonishment echoes throughout the city's 20th century chapter.

Manufacturing by the lake dried up or packed up; if the only problem had been the lake's pollution, there might have been some more momentum earlier to clean it up. But, in fact, the whole 800-acre area between downtown and the lake told the same shameful story of failure and neglect to plan or to marshal resources.

In this tract--just off Interstate 690 and highly visible to the thousands of annual visitors to the New York State Fair (which I directed before becoming Mayor)--there was the old Chrysler Motor's New Process Gear Plant #2. A hulking ruin, it had been abandoned for thirty years when I took office; and I made it my personal goal to have it demolished.

Yet, even as I saw the wrecking ball swinging triumphantly in my mind's eye, someone else had the more positive vision of turning that eyesore into Class "A" office space.

I invite everyone to come see it: a little more than a year after it was acquired from the City, it was magnificently transformed as "Bridgewater Place." It is an astonishing

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example of what talent and imagination can accomplish. . .and it is indeed a 'bridge' to convey those who cannot make a 'leap of faith' into the city's future.

Part of that future is the lakeside development undertaken by The Pyramid Companies, builders of The Carousel Center. This one-million, four-hundred-thousand square-foot shopping center is expected to draw customers from throughout New York, and from parts of Canada and Pennsylvania. Named for the carousel that once graced the lakeshore before Onondaga Lake became an ecological disaster and national embarrassment, the new Center's design boldly anticipates a lake that is restored. There are generous spaces for community gatherings featuring lake views.

This lakeside development is especially important to the future of Syracuse as a city on a lake, because its Payments In Lieu of Taxes and IDA Payment will be reinvested to spur further development along the lakefront and Onondaga Creek.

The City has already done this with charming effect in Franklin Square, just beyond Bridgewater Place. Part of the appeal and potential of the place lay in the historic character of its older buildings. By imposing design standards, the City has emphasized and protected the 'old town' look of the residential and commercial development there. A number of indigenous businesses have invested in handsome renovations to follow suit.

For its part, the City has undertaken massive infrastructure improvements that include new streets, brick sidewalks, and gaslight-era streetlamps. There is also a creekwalk, or public promenade, that will eventually extend from Armory Square downtown, through Franklin Square up to the the lake. We hope to acquire state-owned land along the creek to convert it to public recreation use.

As things stand now, were Representative Nowak to take a pleasure boat, as many people enjoy doing, from Buffalo to New York en route to Washington, he would be able to navigate the various narrow locks and shallow waters of the pleasant canals and inland waterways of Upstate New York; but he couldn't dock in Syracuse, as so many thousands once did in the days of the Erie Canal. Nowadays Syracuse is functionally land-locked. We ask to be a port-of-call again. . .on a lake that isn't poisonous. S27 is the only opportunity we will ever have to accomplish this.

Meanwhile, our projections show that our lakefront development will: increase the City's tax base by over 30%; create over 12,000 permanent jobs; and contribute over one million dollars annually in new sales and property taxes. We are extremely proud that, thus far, all of this economic momentum has been muscled solely by local public and private partnerships.

But to maximize Syracuse's potential to the point that we produce benefits beyond our own community--for the Central New York region, the State, and the Northeast United States--we must have the federal support allocated in S27.

I respectfully urge you to support its passage.

Thank you.

Statement of Sherri Zedd

Statement of
American Wood Preservers Institute

before the
Committee on Public Works and Transportation
Subcommittee on Water Resources

U.S. House of Representatives

on
The Reauthorization of
The Federal Water Pollution Control Act

March 22, 1990

Mr. Chairman and Members of the Committee:

I am Sherri Zedd , Vice President of the American Wood Preservers Institute. AWPI, with headquarters in the Washington, D.C. suburbs of Vienna, Virginia, is a trade association for the wood preserving industry focusing on government relations and environmental affairs. With me today is Victor Lindenheim, AWPI's Vice President for Regulatory Affairs.

AWPI's members produce treated wood products for industrial and consumer uses -- railroad ties, utility poles, marine and foundation piling, decking, fences, and other uses. AWPI's membership also includes companies which manufacture EPA-registered wood preserving pesticides utilized to extend the life of the wood product and thus preserve one of our valued national renewable resources -- our nation's timberlands.

On December 30, 1988, EPA's Office of Solid Waste issued a proposed regulation which would have a devastating impact on the wood preserving industry. The costs of complying with these regulations would eliminate many companies, increase consumer costs, and provide no additional environmental benefit when compared with alternative methods to regulate the industry.

The EPA proposal addresses how the industry handles all wastes and residuals from its processes utilizing only one statute: RCRA. (It does not regulate the use or availability of pressure-treated wood products or the users of these products.)

Fundamental issues raised by EPA's proposal that could have a profound effect on all U.S. industries, include: Which law applies to what material at a facility under the jurisdiction of several environmental statutes? What was Congress' intent in calling for "integration of statutes" and "avoiding duplication" in RCRA and other environmental laws?

Our industry has not fought the idea of regulation. Rather, we have been advocating a multi-statute approach which would integrate provisions of various statutes -- RCRA, the Clean Water Act , CERCLA and FIFRA. It should be noted that all four statutes previously mentioned currently govern various portions of the wood preserving industry. The use of a multi-statute approach would be as protective of human health and the environment as a RCRA-only regulatory method proposed by EPA's Office of Solid Waste. The multi-statute position was formally submitted to EPA in 1987 and has been widely distributed on Capitol Hill. I respectfully ask that our position paper entitled "A Framework for a Multi-Statute Approach to Environmental Regulation of the American Wood Preserving Industry" be included in the record.

One of the most important provisions of the Multi-Statute Approach is the industry's recommendation that process water discharges should continue to be regulated under the Clean Water Act with specific BATEA standards (Best Available Technology Economically Achievable) established for handling process waters. At the same time, we believe that a review of effluent guidelines for discharge of wood preserving process wastewaters should be conducted. This would result in the inclusion of specific effluent limits for various toxic constituents previously overlooked by the EPA. This approach to regulation of wastewater toxicity is not new but rather consistent with the regulation of wastewaters in other chemical handling industries. EPA has completed a review and promulgated similar limits for the organic chemical manufacturing industry; those plants which make the wood preservatives utilized by the industry.

It is industry's position that the review of the wood preserving industry effluent guidelines should receive a high priority from EPA. However, recent actions by EPA have caused concern in our industry. On January 2, 1990 the Agency announced its two-year plans for reviewing and revising existing effluent guidelines as requested by Section 304(m) of the Clean Water Act Amendments. Timber products processing, including wood preserving, was not among the fifteen priority industries scheduled for review and action even though we had been requesting such a review since 1987. The wood preserving industry is concerned about this omission and the failure to follow the multi-statute regulatory approach. We also believe that the Agency may be missing an "opportunity for pollution prevention and cross media pollution" which was stated in the EPA effluent guidelines announcement as a criterion for regulatory action concerning the revision or promulgation of effluent guidelines.

EPA has indicated its intent to further regulate wood preserving wastewaters. Industry concurs with EPA that regulation is necessary; however, industry believes that EPA's major concerns can and should be addressed under the authority of the Clean Water Act as has been the case for other similar wastewaters. Contrary to industry's position, EPA's Office of Solid Waste has proposed to utilize RCRA authority to regulate wood preserving wastewaters. The industry believes that EPA is using RCRA authority to provide a "new" enforcement tool for cleanups of past operations. Those facilities targeted by EPA represent a small portion of the industry. Industry concurs that past operations should be cleaned up, but industry contends that past operations are to be regulated under CERCLA authority not RCRA.Unfortunately, many environmentally sound operations may suffer severely as a result of the over-regulation of wastewaters utilizing RCRA as a tool to force corrective action at a limited number of older wood preserving facilities which have not been cleaned up.

We do not believe that the listing of wood preserving wastewaters as proposed by the Office of Solid Waste is justified as preferable to Clean Water Act regulation. Industry contends that regulation under RCRA will not provide any significant additional human health and environmental protection benefits. Industry also contends that many of the Agency's actions associated with the Office of Solid Waste proposal may be based on operations that no longer exist at wood preserving sites such as surface impoundments and spray fields operations. These two types of operations were undertaken by industry under the advisement of EPA in the mid-1970's in order to meet a goal of zero discharge.

The wood preserving industry is concerned that, if wastewater is listed as a hazardous waste, currently accepted and technically sound management methods, including pretreatment and discharge to municipal sewage treatment plants, will no longer be available. There is the fear that the stigma of hazardous waste listing will create unfounded negative perceptions and could generate local prohibitions against POTW acceptance of hazardous materials. Further, does it make sense to regulate this material in the same manner as highly concentrated sludges and other materials that are more appropriate for possible RCRA controls?

Effluent guidelines and pretreatment standards can be very effective in regulating discharges of waterborne toxics contained in processed wastewater. As previously mentioned, we believe this approach is consistent with recent EPA actions such as the establishment of new and revised effluent guidelines and pretreatment standards for wastewater discharged by organic chemical manufacturers. The wastewaters generated by the wood preserving industry are very similar to those generated by the organic chemical manufacturers, including a number of the same toxic constituents.

Review and establishment of effluent guidelines and pretreatment standards by EPA reflects Congressional intent as expressed in Section 304(m) of the Clean Water Act. It would have been beneficial if the wood preserving industry had been among the industries undergoing such review in lieu of listing all wood preserving wastewaters as hazardous waste.

In summary, I am concerned about the potential impact of a regulatory approach that relies exclusively on RCRA and does not give full and proper consideration to Clean Water Act authorities. The industry views the Clean Water Act as providing far greater flexibility for regulation of wastewater while at the same time achieving the same protection of human health and the environment. And I hope that this viewpoint will be given consideration by the Committee and by EPA.

Mr. Chairman, this concludes AWPI's prepared testimony. I will be happy to respond to any questions.

FRAMEWORK FOR A MULTI-STATUTE APPROACH TO ENVIRONMENTAL REGULATION OF THE AMERICAN WOOD PRESERVING INDUSTRY

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Society of American Wood
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September 21, 1987

FRAMEWORK FOR A MULTI-STATUTE APPROACH TO ENVIRONMENTAL REGULATION OF THE AMERICAN WOOD PRESERVING INDUSTRY

As a result of several meetings with EPA officials over the past two years, the American Wood Preservers Institute (AWPI), Society of American Wood Preservers (SAWP), and National Forest Products Association (NFPA) have considered a number of issues regarding the proper scope of regulation of the wood preserving industry's process residuals and wastestreams. The industry believes that protection of human health and the environment can be provided effectively and efficiently while assuring the public continued availability of a safe and useful product at a reasonable price, as well as preserving the existence of a small but important domestic industry. The purpose of this paper is to provide the framework for further thought and discussion among industry, government and other concerned parties.

A. BACKGROUND

The Industry has specific concerns regarding the draft proposal that was prepared and circulated for comment in February of this year. Although we recognize that a number of wastes generated by our processes are appropriate items for regulation, the Industry questions the unprecedented scope of the draft proposal for a number of reasons. Four of our major concerns are expressed below.

1. Listing Mandate

First, Industry believes that the draft proposal evidences a misconception regarding the Agency's statutory directive. There is no Congressional mandate to list wastes from the wood preserving industry. Section 3001 (e) of RCRA (Section 222 of the Hazardous and Solid Waste Amendments of 1984 (HSWA) provides simply that the "Administrator shall, where appropriate list under subsection (b)(I), additional wastes containing chlorinated dioxins or chlorinated dibenzofurans and wastes containing remaining halogenated dioxins and halogenated dibenzofurans." (emphasis added). Industry believes that this language is not a simple mandate to list all wastes which have any constituents related in any manner to chlorinated or halogenerated dioxins and dibenzofurans. Rather, Congress directed EPA to consider whether certain wastes may be "appropriate" for listing, taking into consideration the many criteria for listing. See, S. Rep. No. 98-284, 98th Cong., 1st Sess. p. 34. A review of the legislative history of Section 222 of HSWA shows that Committee reports make no mention whatsoever of wood preserving wastes. If Congress had intended that the Agency specifically address the wood preserving industry as a RCRA priority it would have so stated in Section 222(e)(2), which specifically cites RCRA priority industries such as inorganic chemicals, petroleum refining, paint production etal.

2. Alternate Statutory Authorities

Second, the draft proposal fails to recognize that the industry's process residuals and wastes should be addressed by a multi-statute approach to environmental controls. Pursuant to RCRA, for example, a number of wastes are currently addressed by listings (see K001, F027 and U051) and other wastes are designated as hazardous by virtue of failing the E.P. Toxicity tests (D004 and D007). In particular, many of the wastes from plants treating with arsenical/chromate preservatives are already regulated under RCRA. Moreover, the Industry recognizes that several wood preserving wastes may be appropriate candidates for listing. Thus, RCRA authorities would continue to play an important role in the regulation of the industry's wastes. Other statutes, however, are more appropriate to address various other environmental concerns.

The Federal Insecticide, Fungicide, Rodenticide Act (FIFRA) is one example of an existing statute that should be considered by EPA. FIFRA currently regulates the use of registered pesticides by the wood preserving industry. The pesticides utilized at the facilities are those regulated, registered wood preserving chemicals, including creosote, pentachlorophenol, chromated copper arsenate (CCA), ammoniacal copper zinc arsenate (ACZA), and copper naphthenate. As such, each wood preserving facility is responsible for compliance with FIFRA and the associated pesticide program regulations at 40 C.F.R. Parts 150-168. In general, the pesticide program regulations implemented by the Office of Pesticide Programs regulate the wood preserving production process, including the application, handling, and disposal of excess pesticides (i.e. wood preservative).

In 1984, the Office of Pesticide Programs concluded an extensive evaluation of the wood preserving industry that resulted in additional regulation of the production process. This includes the establishment of guidelines to be followed by all wood preserving facilities with regard to application and handling of wood preserving chemicals. The operational requirements are included by all manufacturers of the pesticide chemicals on the label for their specific product. Under penalty of law, the applicators of wood preservative are required to follow the use regulations set forth on the label. As such, pesticide labeling language outlining operational parameters under which preservative and excess preservative must be handled as a condition of purchase and use can be considered as a preferable alternative to "end of pipe" regulation.

Under the Clean Water Act (CWA), the Agency has authority over all discharges (including wastewaters and stormwater runoff) to surface waters. As such, process wastewater and contaminated stormwater generated at wood preserving facilities can be regulated under the CWA and its implementing NPDES regulation. EPA's authority under CWA also extends to possible contamination from process areas through BMP control guidelines. Indirect discharges are regulated by pretreatment standards and local ordinance.

An additional statute has had a dramatic impact on the manner in which the wood preserving industry manages its waste materials. Congress passed the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA") in order to address contamination associated with past waste handling practices. Congress has directed EPA to create a mechanism for dealing with these sites. Thus, failure to regulate certain wastestreams as listed (e.g., contaminated soils) does not mean that the contamination will go unaddressed. Under CERCLA, EPA has authority to address soil and groundwater contamination at any site by implementing the established procedures to determine that a site has attained the priority for remedial action.

3. Regulation of Current/Past Practices.

Third, the Industry believes that waste management and operating practices that occurred many years ago are improperly influencing the recommendation for across-the-board RCRA listings.

There is a need to identify and separate the problems of the past from current and future practices. With implementation of reasonable facility modifications and controls, as is currently taking place throughout the industry, further contribution to environmental degradation can be eliminated. Historically, environmental problems resulting from wood treating operations such as groundwater contamination, can largely be traced to surface impoundments, unlined, and used as standard practice in which a hydraulic head created downward intrusion. With the progression of statutory restrictions, unlined surface impoundments will be taken out of service by the end of 1988. Today, wastewaters are, as a matter of practice and regulation, recycled and/or treated for permitted discharge. This eliminates surface impoundments: the major source of potential groundwater contamination.

In addition, industry is moving toward containment within process areas. Drip tracks in front of treating cylinders became heavily laden with preservatives which dripped from freshly treated wood and became a lesser source of possible groundwater contamination. As an example of industry progress, arsenical wood preserving plants, which are generally newer facilities, have typically been constructed to contain and reuse process drips and spills.

4. Economic Impact

Finally, the Industry believes that the draft proposal fails to accurately project or assess the economic impact that the draft proposed listings, if finalized, would have on the industry. The economic projections contained in the draft documents which have been made available to industry simply do not make sense. We have conservatively estimated that industry compliance costs under RCRA for just one listed residual-- storage yard storm-water runoff -- would range from 1.8 to 2.3 billion dollars. Industry's total sales of treated wood in 1985 were approximately 1.2 billion dollars. In addition, the attendant costs of the TSD facility designation, costs of treatment, storage and disposal of soils and other high volume/low toxic concentration wastes need to be considered. "Acute hazardous" and "hazardous" designations also need to be looked at from the related standpoints of stigmatization and waste management facility acceptance; i.e., de facto capacity.

B. INDUSTRY STRATEGY FOR REGULATION OF WOOD PRESERVING WASTES.

The Industry believes that a multi-statute approach to addressing process residuals and wastes is an appropriate alternative to the strategy presented in by the draft proposal. The objective of industry's multi-statute proposal is to ensure continued protection of human health and the environment while maintaining the economic viability of the industry. This approach recognizes that regulation of certain industry wastestreams under RCRA is both appropriate and necessary. However, Section 1006 (b) of RCRA requires the Administrator to integrate all provisions of RCRA with appropriate provisions of various other statutes administered by EPA, to the extent that this can be done in a manner consistent with the goals and policies expressed in RCRA and the other statutes. To this end we believe that certain environmental issues of concern regarding these plants (*e.g.*, stormwater runoff, previously contaminated soils) are better addressed by the statutory and regulatory schemes that have been developed to deal specifically with these issues.

Presented below is a description of industry process residuals and wastes and the recommended methods for regulating these materials.

Wastewater: Regulate under CWA

- Develop Best Conventional Pollutant Control Technology/Best Available Technology Economically Achievable standards for direct discharges, and pretreatment standards for indirect discharges.

- This approach would involve a reevaluation of the "zero discharge" standard promulgated in the industry's effluent limitation guidelines in light of the changing wastewater treatment technologies utilized by the industry and changes in applicable statutory and regulatory requirements.

- Where appropriate, develop Best Management Practice guidelines for all facilities designed to minimize the generation of wastewater and ensure the adequate containment, treatment and reuse/recycle of it.

Stormwater: Regulate under CWA

- Regulate stormwater in conjunction with the NPDES stormwater regulations currently being promulgated. Develop a management standard consistent with the Clean Water Act Best Management Practices program.

Wastewater Residuals List under RCRA

- Regulate specific wastewater residuals when they are removed from wastewater treatment processes, are intended for disposal, and, where appropriate, exceed established risk/concentration-based levels of contamination.

- Oil water separators and other preservative recovery units are part of the production process and, therefore, are regulated under FIFRA with regard to the recovery and re-use of excess pesticide (preservative).

Process Residuals:	List under RCRA . Regulate specific residuals when they leave the production process, are intended for disposal, and, where appropriate, exceed established risk/concentration-based levels of contamination. This includes residuals/sludges generated in storage tanks and work tanks associated with wood preserving processes; residuals/sludges generated from the clean out of wood treating cylinders (retorts) associated with wood preserving processes; residuals/sludges from the clean out of door pits located at the entrance of wood treating cylinders (retorts) associated with wood preserving processes; and filter solids from the filtration of wood preserving formulations in wood preserving processes.
Drippage:	Regulate under FIFRA . Develop a Best Management Practice (BMP) under FIFRA requiring containment, collection, and recycle of process-related drippage within the production process area (i.e., within drip pad).
Spill Residues:	Regulate under FIFRA (except as currently regulated under RCRA and/or CERCLA as commercial chemical products). . Develop a Best Management Practice (BMP) for containment of all potential production process spills (i.e., tank farm, retorts, front door pits, piping, etc.).

Treated Wood Residuals:

- Continue current regulation under FIFRA and RCRA
- Where appropriate, use RCRA characteristic tests.
- State solid waste programs cover disposal of these materials.
- Dispose of wood residuals in accordance with existing industry-applied standards in conjunction with FIFRA, (e.g., use approved industrial incinerators or sanitary landfills: No open burning).

C. SUMMARY

As presented above, there are several existing statutes which can be applied to regulate the wood preserving industry's production process and waste handling practices. The Industry believes that a multi-statute approach serves the dual objectives of strictly safeguarding human health and the environment and maintaining the continued viability of our industry.

REAUTHORIZATION OF THE FEDERAL WATER POLLUTION CONTROL ACT

WEDNESDAY, APRIL 4, 1990

House of Representatives,
Subcommittee on Water Resources,
Committee on Public Works and Transportation,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:06 a.m., in room 2167, Rayburn House Office Building, Hon. Henry J. Nowak [chairman of the subcommittee] presiding.

Mr. **Nowak**. Good morning. The subcommittee will come to order.

The Subcommittee on Water Resources meets to continue its hearings concerning the reauthorization of the Federal Water Pollution Control Act. The Federal Act was last reauthorized and amended in 1987 with the enactment of the Water Quality Act of 1987 over the veto of President Ronald Reagan.

When the Federal Water Pollution Control Act was substantially rewritten in 1972, it established an expanded federal commitment to clean up our nation's waters. Although Congress has had a role in water pollution control as far back as the 1890s, it was the Federal Water Pollution Control Act Amendments of 1972, which provided the most comprehensive legislative response to water pollution problems to that time. These amendments established the basic statutory authority under which the program currently operates.

The Act set a goal of fishable and swimmable waters by 1983, and the elimination of all pollutant discharges by 1985. As we all know, these goals have not been met.

Several of the Water Pollution Control Act's programs monetary authorizations are expiring at the end of this fiscal year and several others expire at the end of fiscal year 1991. At these hearings we will explore issues related to the reauthorization of these programs and receive testimony concerning other aspects of the Federal Water Pollution Control Act. With us today is a member of Congress, who is also a member of this committee, and several individuals with a keen interest in the Water Pollution Control Programs and National Associations as well as the State Governments represented.

Before we begin with our first witness, I yield to my distinguished colleague from Minnesota, the ranking Republican member of the subcommittee, Arlan Stangeland for whatever opening remarks he would like to make.

Mr. **Stangeland**. Thank you, Mr. Chairman.

Today we meet to hold our third, and perhaps the final hearing, on reauthorizing various Clean Water Act Programs and activities that expire this year or next. In our last two hearings we focused on State Revolving Loan Programs, combined sewer overflows, issues involving research permitting and site-specific water quality problems. Today we will look at these same issues in closer detail. At some point though, we will also focus on other important programs involving, among other things, the Great Lakes, National Estuaries, and the Chesapeake Bay.

Mr. Chairman, we also need to look at reauthorizing and strengthening provisions on rural clean water, clean lakes and nonpoint source pollution. These are proven, effective programs and it makes good sense, as well as good public policy, to continue emphasizing the important relationship between agricultural practices and surface and ground water protection. For that reason, Mr. Chairman, I am introducing legislation to integrate agricultural and environmental protection policies and initiatives.

My bill, Sustainable Agriculture and Clean Water Act of 1990, will be referred to both our committee and the Agriculture Committee, and my hope is that it can be part of the debate in the 1990 Farm Bill, and on reauthorizing the Clean Water Act.

I am looking forward to hearing our witnesses today. I am sure they are going to lend a great deal of insight as to what we should do in the final analysis.

Thank you.

Mr. **Nowak**. Thank you very much, Congressman Stangeland.

We will now turn to our first witness, Congressman Nick Joe Rahall, who has represented West Virginia, on this committee and has been one of the great leaders in pursuing the goals of the Water Pollution Control Act. It is a pleasure to have you on the other side of the table, Nick.

TESTIMONY OF HON. NICK JOE RAHALL, A REPRESENTATIVE IN CONGRESS FROM WEST VIRGINIA

Mr. **Rahall**. Thank you, Mr. Chairman.

I appreciate this opportunity to be before your distinguished subcommittee on water resources and appreciate the opportunity you have given me to testify. I also wish to express my appreciation to Representative Stangeland for his valuable work on this committee and dedication to the water resources of this country.

Mr. Chairman, I am speaking today in support of H.R. 3930, legislation to reauthorize Title II Construction Grants Program which expires at the end of fiscal year 1990.

As you know, the EPA's National Needs Survey 1988 Report to Congress on waste water construction needs demonstrates that, as a Nation, we have yet to fully attain even minimal national objectives for health based sewage treatment. The survey reports over $26 billion in unmet construction needs for secondary treatment and attainment of State water quality standards for conventional pollutants. Altogether, unmet needs for municipal water pollution control total $83.5 billion under the Clean Water Act's framework.

As you also know, Mr. Chairman, the Title II Construction Grants Program will be phased out this year in favor of State Revolving Loan Funds. Essentially, this program will place the burden of meeting the Clean Water Act's requirements squarely upon the shoulders of State and local governments. After 1994, the Federal Government can wash its hands of any further assistance.

I am very concerned about the SRF Program. The expectation is that the federal contributions to SRF, beginning in fiscal year 1989, will assist in making a transition to full State and local financing by fiscal year 1995. If full funding for this program is provided for the SRF Program, which is highly unlikely, the SRF will be able to provide a total of only $9.6 billion. This represents only 36.9 percent of the funds needed to meet our unmet construction needs for secondary treatment and attainment, and only 11.5 percent of the funds necessary to meet our total unmet needs for municipal water pollution control.

In addition, as you are fully aware, Mr. Chairman, there is a significant difference between a grant program and a loan program. Loans must be repaid with interest. This new program may favor the Federal Government by allowing it to remove itself from assisting local governments in the construction of sewage treatment facilities, but it does not favor small, economically distressed communities, such as I represent in West Virginia, and such as those in other parts of this country. These communities cannot afford to repay loans and depend upon an infusion of funding to meet their needs and the requirements of the Act.

In a 1989 report entitled, "Small Community Infrastructure," the Council of Infrastructure Financing Authorities estimated that fully 55 percent of municipalities with a population less than 2,500 would either need subsidized loans and grants or would require grants to proceed.

I believe that it is clear that the SRF Program will not meet our growing unmet water treatment needs alone. It will not be given the funds necessary initially, nor will it generate the funds necessary.

I see no reason, Mr. Chairman, why the SRF Program and the Title II Construction Grants Program cannot coexist. Reauthorization of the Grants Program will provide additional funds which are obviously necessary to meet our Nation's total unmet needs. Reauthorization of the Title II Grant Program will also ensure that the smallest and poorest communities have the possibility of safe drinking water.

Chairman, I would greatly appreciate your support for this legislation and I would urge that hearings be held on the merits of the bill. I again appreciate this opportunity to testify before you and thank you very much for your dedication and work in this area.

Mr. Nowak. Thank you very much.

As you know, back in 1987 when these were adopted, they were the result of a long series of negotiations to reduce the federal obligation to this program. We will certainly be looking at your recommendations and will be pleased to work with you as we move toward the mid-course corrections. I think you will find others urging as well some variation of the same theme that you are proposing here today. We, even before we get to that stage, however, have to make sure that the dollars already authorized out there are fully funded. We have moved this program to a minimal level and then, as you pointed out, from a Grant Program to a Loan Program and then reduced the Loan Program. So we have to fight I think on several stages at the same time and we appreciate your strong interest and your leadership in this area.

Mr. **Nowak**. Mr. Stangeland.

Mr. **Stangeland**. Thank you, Mr. Chairman.

You advocate funding the Construction Grant Program at 2.4 billion through 1994; is this in lieu of the SRF or is it in addition to?

Mr. **Rahall**. In addition to.

Mr. **Stangeland**. Would you favor allowing each State the flexibility to use construction grant funding to finance their Revolving Loan Program?

Mr. **Rahall**. Allow the States that flexibility?

Mr. **Stangeland**. Yes.

Mr. **Rahall**. Yes, I would favor that.

Mr. **Stangeland**. I am not at all certain that with this budget problem that we have got that we are going to be able to meet your requests totally. Would it be helpful if we extend it—the time when we participate in establishing SRFs?

I think what we have to do is look at what States are doing and how many States are establishing—have established—what their mechanism is and then determine are we phasing out too rapidly.

I think the policy may well end up being a phase out. The question is how we do that. I think I have the same problem you have. I made the argument initially for a ten year phase out. The major communities, because they were the major priorities, were given assistance and now the small communities, because they were not that large a priority—they were not that large a concentration of people treating waste water, were left out. They are the ones as you pointed out, who really can't afford to do it on their own, or they probably can't afford to do it with loans, so they need some more assistance. We appreciate your input and testimony and certainly will work with you as a member of this committee.

Mr. **Rahall**. I appreciate that, Mr. Stangeland, and certainly you know the problems in this area very well. Your suggestion of a possible phase out would be better than what is currently on the table and lacking the full funding as I have requested, you would not find much objection from this particular member.

Mr. **Stangeland**. Okay. Thank you, Nick.

Mr. **Nowak**. I would like to welcome, for her first hearing, the first opportunity she has had, Susan Molinari, who was just elected from the great State of New York, I believe, Susan. We want to welcome you. Your presence here will be welcomed in looking at the vast amount of interest that New York State has, and in fact, they will be testifying later.

Welcome to the committee and if you have any questions for our colleague, I am sure he would be more than happy to answer them.

Mr. **Rahall**. Sure would.

Ms. **Molinari**. Not at this time, thank you.

Mr. **Nowak**. Thank you, Susan.

Mr. **Stangeland**. Mr. Chairman, we are in a mark-up on the wheat and feed grain section of the Agriculture Committee, of which I am a member as well, and I am going to have to be leaving this hearing and Ms. Molinari is going to be sitting here as the ranking member. So she has come up in the world real fast, but I know she has the background and the expertise from the receiving end in New York and now she has got a chance to have some experience and knowledge from the delivery end. So she will be sitting here for most of this hearing with you, Mr. Chairman.

Mr. **Nowak**. I just want to reference the fact that Ms. Molinari was a minority leader on the New York City Council so it is not a big step for her.

Ms. **Molinari**. I wouldn't say that.

Mr. **Nowak**. Thank you very much, Congressman Rahall.

Mr. **Rahall**. Thank you, Mr. Chairman.

[Mr. Rahall's prepared statement appears on page 706.]

Mr. **Nowak**. Our next witness comes from the National League of Cities, and of course they are greatly affected by everything that we do on this subcommittee, and have worked with us to try to faction the best possible response to the water pollution problem. We want to welcome Mayor Don Plusquellic. Is that close, Don?

Mayor **Plusquellic**. Yes, sir.

Mr. **Nowak**. From the City of Akron, who is the Mayor of course, Mr. Mayor.

TESTIMONY OF HON. DON PLUSQUELLIC, MAYOR, AKRON, OH

Mayor **Plusquellic**. Thank you very much.

Mr. Chairman, members of the committee, my name is Don Plusquellic, Mayor of the City of Akron and a member of the National League of Cities Energy, Environment and Natural Resources Steering Committee. I am happy to be here to testify on behalf of NLC and the 16,000 cities and towns across the Nation we represent and I appreciate you giving us the opportunity to discuss and make our comments on the Clean Water Act.

We are certainly pleased to see Congress re-examine the Clean Water Act because it provides an opportunity to review whether the program is indeed working in the way it was intended, or if it's implementation merely frustrates the efforts of local governments to meet Federal environmental mandates.

Let me be clear at the outset, in the most emphatic way that I can, that the elected officials in the nation's cities and towns support initiatives and efforts to clean up environmental problems and to make investments in preventing further pollution.

But our support is tempered by reality. We are rapidly approaching a critical overload in the municipal level. Just in the last two years municipalities across the Nation have been confronted with numerous Federal environmental mandates—new Federal environmental mandates, which will require municipalities to spend an estimated $62 billion.

We in America's cities have heard the battle cry of "No new taxes". We have also seen more and more of those Federal financial burdens shifted to the backs of states and cities without any idea of where we will obtain the additional monies to fund these additional programs. The cities don't have anyone or anywhere to pass the buck further. The buck really stops with the cities and the taxpayers we represent.

We know these are difficult times for everyone, but we cannot be paralyzed from acting. Cities are investing in clean environments. This year alone, in the City of Akron, we will be spending approximately $20 million, of our total $80 million in capital improvements budget, on clean water alone. States are investing in a cleaner environment and it appears to us only the Federal Government is reducing its financial commitment to the environment. That unfairness is behind the breakdown, we believe, in our partnership.

There are four major issues confronting the nation's cities and towns in the implementation of the Clean Water Act. Firstly, Federal funding commitments to assist the nation's municipalities in meeting federal clean water mandates; secondly, EPA's guidance on the State Revolving Loan Funds; implementation of policies designed to address problems with storm water, both combined sewer overflows and separate storm sewer systems; and fourthly, EPA's rule making process. I would like to address these individually.

First, the federal funding commitments. As you know, funding for the construction of municipal sewage treatment plants has been cut below authorized levels every year since the 1987 amendments. Again, this year, the administration is proposing significant reductions in funding for this program. It becomes impossible for local officials to plan if we never know what resources will be available to us.

As the Federal Government moves to eliminate federal grants entirely and encourages the use of tax exempt financing, the concern about consistency increases. Any federal action which undercuts our ability to finance bond funding further interferes with our ability to comply with environmental mandates.

Secondly, EPA's guidance on the State Revolving Loan Funds. Recognizing the deficit problems facing the Federal Government, and being willing partners in supporting your efforts to solve those problems, NLC supported moving to a revolving loan program as an alternative mechanism for funding financial assistance to municipalities that had not yet met the law's requirements for secondary treatment of all waste water.

You can imagine our dismay when no one raised any objection to EPA's guidance on the SRF allowing the States to use interest paid by local governments, on loans from the SRF, to meet their matching share requirement. Our perception was that we'd really been "had". Not only will municipalities who were not top priorities for funding with grant money now have to pay 100 percent of the constructions costs, but from our perspective, it seems clear that they will have to pay the State's matching share as well.

Thirdly, the implementation of storm water control policies.

I can assure members of this committee that the Nation's cities and towns are looking at what is yet to come—programs to control pollution from storm water runoff—with fear and trepidation.

While cities and towns are spending millions of dollars as we move toward managing CSOs, storm water and continuing waste water treatment requirements, we are receiving far too little technical and policy assistance from the Federal Government.

There is a limit to the capacity of municipalities to raise funds for this requirement. Where the environmental and public health benefits can be clearly shown, the voters on bond referenda and local taxing entities, usually respond well. However, where there is no clear benefit, but only extensive studies, repetitive tests, and uncertain changing requirements, it is very, very difficult to "sell" our citizens on the merits of approving funding for these mandates. Just by way of illustration, Akron's sewer rate has been increased an average of 15 percent per year over the last four years to try to attempt to meet the requirements.

We need help and we want to reinvigorate our flagging partnerships at all levels of Government to meet our clean water needs. We are frankly concerned, however, that EPA will be tempted to rely solely on its enforcement powers to give the impression that it is dealing with the problem.

NLC has joined with the CSO Partnership and looks forward to working with this committee in attempting to develop and propose workable and cost effective solutions to CSO problems. A similar effort will undoubtedly be necessary in the near future to deal with managing separate municipal storm water systems as well.

Lastly, EPA's rule making process—Congress approved a management program for separate municipal storm water sewers in the 1987 amendments and mandated that municipalities with populations in excess of 250,000 file applications for permits by February 4 of this year. February 4 has come and gone, the requirement to file permit applications is in effect, cities failing to file the required permit are subject to enforcement actions and citizen suits, and we have yet to see for what sort of a program we are to file an application. One cannot judge, from the proposed guidance, where the agency is headed with this program so in this case a best guess isn't even possible on our side.

Clearly, EPA needs either additional resources, or additional time, or both, to meet the congressional deadlines that have been established. We simply cannot continue a process in which cities and towns are vulnerable to enforcement actions and citizen suits because another level of government was unable to meet congressionally-mandated deadlines.

With that, Mr. Chairman, I would like to thank you once again for the opportunity to present my views and the views of the National League of Cities on this issue. I would be happy at this point in time to try to answer any questions that members of the committee may have.

Mr. Nowak. Thank you very much, Mayor.

We have, as you heard from our first witness, not only technical changes—minor changes in the Act to consider this year, but also, we are going to try to set the agenda for an information base, if you will, for everybody in the country to start to realize what impacts—what losses there could be in this whole program if it remains in the gridlock that it is in. In trying to pursue the detail through the maze of requirements out there going out to the States and especially to the localities, without the requisite funding for the fulfillment—I guess we are going to attempt to try to measure some of the costs against some of the benefits in a more definitive way as we pursue the goals of the Clean Water Act.

One of the areas that we are going to review, despite the federal deficit, is the cost to States, and especially the counties and cities and the sewer districts, that have to actually implement the programs and mandates—you point this out well I think in your testimony.

When you refer to your 15 percent increase in cost for water and sewer do you have a breakdown as to in your town of Akron? How big is Akron? How many people do you have presently——

Mayor PLUSQUELLIC. Approximately 240,000 people. I think the last census was 237,000 if I recall correctly.

Mr. NOWAK. It probably hasn't grown——

Mayor PLUSQUELLIC. Not much.

Mr. NOWAK. Since the last census.

When you look at your water and sewer costs, can you give us an approximation of what your local tax has risen to through those 15 percent increase years?

Mayor PLUSQUELLIC. Right. We have a system whereby we charge a separate amount for the water and then a separate amount for the sewer bill. I could estimate both of those for an average family running approximately $16 a month for each.

Mr. NOWAK. So its about a $30 charge a month or $360 a year?

Mayor PLUSQUELLIC. A little higher than that, probably $32 to $35, but in that range—$30 to $35 for both.

Mr. NOWAK. $360 to $400 a year, somewhere in there?

Mayor PLUSQUELLIC. Yes.

Mr. NOWAK. That includes water treatment as well I take it?

Mayor PLUSQUELLIC. The sewer bill is a function of the water—it's a percentage of the water usage. That's how it is calculated, but that pays for the water treatment—the waste water treatment. Yes, sir.

Mr. NOWAK. In your testimony you mentioned the CSO problem and we had testimony recently, in fact I had a private meeting with the Conference of Mayors, and I guess that is your sister organization.

Mayor PLUSQUELLIC. Right. Yes, sir. I'm a member also.

Mr. NOWAK. You are a member of that organization also.

They brought home very forcefully the tremendous increase in costs if we are to fully attack that, and along with that, I tried to elicit the consequences if we don't look at the CSO problem.

In terms of total cost, the figures that were given to us will astronomically dwarf the amount of dollars that we have spent already, going from primary to secondary treatment throughout the country since the 1972 Act took effect. So we have a great many challenges out there if we are to achieve the goals of swimmable, fishable in every area of the country.

When you look at the nonpoint source, pollution, and just the CSO you're going to be involved with an awful lot of money and that of course is almost dependent on going to first, secondary treatment throughout the country, and we're not there yet. So as you rightly point out, we have got to start to prioritize and start to see where the largest impacts would be. I think when you realize the transitory nature of water, we are going to have to have a Federal National Program, if we are going to sustain and really get the benefit of the dollars we have already invested in this program.

I appreciate your testimony today and we will leave the record open. I plan to get back to many of the groups and organizations that have testified to clarify, and try to solidify if I can, some of the major points and major corrections that we are going to look forward to implementing after these hearings. So we may get back to you.

Let me turn now to Ms. Molinari.

Ms. MOLINARI. Thank you, Mr. Chairman.

I actually have something to say on this topic. Coming from my former life, as you correctly pointed out, I represented an area of Staten Island that became rather famous several summers ago with regard to the influx of medical waste that washed up on our's and New Jersey's beaches. While we initially thought that the presence of medical waste, and some of it was there because of illegal dumpers, a good portion of it did find its way, and continues to find its way, and close our beaches through the use of combined sewer overflows that create quite a problem.

Clearly, New York City has one of the most complicated and largest CSO systems still functioning in this Nation and I believe, Mr. Chairman, for your point of reference, when I left the New York City Council, New York City DEC was about to embark on a $2 billion project to try and control some of the larger CSOs affecting beaches. When you take that cost and add with it, I know our City is just ready to handle the effects of the ocean dumping law with regard to sludge management, and the incredible cost that that poses on our cities, that your points are truly well-taken. I only would like to add, because I know New York City has certain ideas, and I'm sure cities like Akron also do, that from here on in perhaps the National League can come forth with some very clear technical amendments with regard to EPA rule making that we can take into consideration from a municipality perspective.

Mayor PLUSQUELLIC. I appreciate that suggestion.

I think we, in the National League of Cities as well as the U.S. Conference of Mayors, need to take every advantage of that and I appreciate that. I think that there is one significant point that I would like to make in following those comments, and that is that in the past, the U.S. EPA has provided a great amount of technical assistance to do those sorts of things—to try to work directly with cities to try to solve the problem, rather than taking cities directly into court and then using fines not to treat the problem, but to supplement the federal budget, and I think that is part of the problem, that the U.S. EPA is not viewed now by cities in particular as a partner in trying to solve the problem by working through and coming up with some of those creative solutions, but rather, it is forced on the cities to come up with the creative solutions to these things. I think that the technical assistance that could be provided nationally by people working on similar problems, obviously, in each and every community would be very, very helpful to see once again.

Ms. MOLINARI. Again, I think your points are well-taken.

When you realize the nonjurisdictional aspect of the water control problems that we have where municipalities may be hesitant to expend substantial amounts of money when their neighboring State or municipality is not going to make the same investment, therefore the problem is not going to be eliminated, is a very discouraging aspect of this reauthorization.

Thank you.

Mr. NOWAK. Thank you very much.

One last question. The bonding of your local improvements—are you issuing bonds directly from your separate authorities or is this city bonding in Akron, and how are the planned changes in the tax law affecting your ability?

Mayor PLUSQUELLIC. Well, I think as a general statement—let me take the last first.

I think as a general statement the general concern that has been stated before, I am certain by a number of people in the National League of Cities with a tax exempt status and that whole issue, the direction certainly can do nothing but hurt cities' abilities to go out in the bond market and compete with various other entities. So that is, in a general sense, an overall problem I think for most municipalities and we see it as a growing problem down the road.

The taxable versus tax exempt bonds—we in Akron are—we have an authority that really is the municipal government, but our funding sources are kept separate, the funds are kept separate, and so the sale of bonds that we do is basically through the authority of the city, but not our general obligation bonds that we normally would use for other purposes. We solely sell the bonds for the revenue stream from the sewer funds. So it is not a regional authority as such, although our facility—our treatment facility in particular, serves many, many jurisdictions in our county—if that answered your question, but it is based on the revenue stream from the sewer funds.

Mr. NOWAK. Do you know what interest rate you could float those bonds on—how you are rated—how that revenue bond is rated?

Mayor PLUSQUELLIC. I can't tell you the last. We just had a sale, here in the last couple of months, and I can't honestly tell you.

Mr. NOWAK. I wonder if you would, Mr. Mayor, on behalf of all of your cities, take a reading and a survey to see what kind of ratings they have been getting and what kind of interest they have been able to sell—especially the revenue bonds at, when it is backed up by your sewer and water tax.

Mayor PLUSQUELLIC. I would be happy to provide that.

Mr. NOWAK. I think we are going to need that information when we try to calculate out the Revolving Loan Program's incentive, if you will, for use by the municipalities. There are other disincentives, I think, when you look as we move from the grant to the loan program. I think we have another factor here in the communities' ability or advisability, if you will, to use their own funding and opt out perhaps for one or many reasons. We want to make sure we still have an incentive to make that revolving loan as successful as we can and as attractive as we can.

Any direct testimony you could submit after a review of that question by your league cities would be very much appreciated.

Mayor PLUSQUELLIC. I'll provide that.

Mr. NOWAK. Thank you very much and thank you for your testimony.

[Mayor Plusquellic's prepared statement appears on page 697.]

Mr. NOWAK. We will now move to Mr. Edward O. Sullivan, who is Deputy Commissioner, Office of Remediation, New York State Department of Environmental Conservation.

We welcome you Mr. Sullivan, and we will accept of course, everyone's written statements into the records in their totality and will let you proceed as you desire.

Mr. LAUGHLIN. Mr. Chairman, I'm sure you didn't see me sneak in late.

Mr. NOWAK. Oh, I didn't.

Mr. LAUGHLIN. I had no questions for the last witness, but I did want to welcome our newest member to the committee, Congresswoman Molinari—if I'm saying that right—we don't have that name in south Texas, but we look forward to working with you. I particularly look forward and want to welcome you to this committee.

Ms. MOLINARI. Well, thank you very much. You said it just fine.

Mr. LAUGHLIN. Thank you.

Mr. NOWAK. That's what we have from the southern gentleman from Texas—the welcomes—and he has played a very strong role as a new member too on this committee and we welcome both of your input.

Mr. LAUGHLIN. With all respect to the Chairman, Congresswoman, he mispronounces my name each time and so I——

Mr. NOWAK. Laughlin. Congressman Laughlin.

Mr. LAUGHLIN. And I just smile and bear it. Thank you very much for bearing with me.

Mr. NOWAK. Mr. Sullivan?

TESTIMONY OF EDWARD O. SULLIVAN, DEPUTY COMMISSIONER, OFFICE OF REMEDIATION, NEW YORK STATE

Mr. SULLIVAN. Mr. Chairman, members of the committee, I appreciate the opportunity to appear before this subcommittee today to discuss the Federal Clean Water Program.

I come wearing two hats—I'm Deputy Commissioner for Environmental Remediation of the New York State Department of Environmental Conservation—the agency within New York State charged with water pollution control regulatory and municipal assistance responsibilities. I am also Commissioner Jorling's designated Chair for the governing board of the New York State Environmental Facilities Corporation—the public benefit corporation that carries out the financing aspects of the New York State Water Pollution Control Revolving Fund or the SRF.

I come with good news. Just last week the U.S. Environmental Protection Agency approved the largest single grant in its history when it awarded to New York State its initial SRF Capitalization Grant of $212 million pursuant to Title VI of the Federal Water Quality Act of 1987. By year's end, we will make more than $600 million in low interest loans to municipalities to build water pollution control facilities using this as our base of financing. Our first SRF loan to be made next month will be the largest in the Title VI Program to date—$170 million. I think this represents a testament to the wisdom of congressional intent in establishing this new program and to a successful cooperative effort of the U.S. Environmental Protection Agency and New York State.

I would like to first make some comments on funding levels. Mr. Chairman, I realize that this subcommittee deals with the authorized levels rather than actual appropriations to carry out the purposes of the Act. Nevertheless, we feel that the existing program authorized by the Clean Water Act should be fully funded and are concerned with the levels of appropriation that have occurred and the impact that this is going to have on our program.

Among the programs where continued, and we feel enhanced funding is critical, are the nationwide Nonpoint Source Management Program, Basic Water Quality Program Administration, the Natural Estuary Program and the Federal Clean Lakes Program.

We are particularly concerned about the levels of appropriations that have occurred under the Title VI Program. As you know, the initial authorization of $8.4 billion to establish the State Revolving Funds has been underfunded for the first two years by approximately 20 percent. This hardship could be at least partially rectified if the authorized levels for future years were increased to account for the cuts experienced in 1989 and 1990 and those potentially in 1991.

While New York will be using the most aggressive program structure possible under this program, we project we will be able to finance through loans, only about half of our identified $9.8 billion in needs through the year 2000.

I just want to make one short comment on the allocation formula—that formula for allocating Title VI money among the States. We believe that that formula is good as is and the final four years of the program should follow the existing formula. It is our understanding that there is a consensus among other States that this is the case as well.

I would now like to address some issues that we have encountered in implementation of Title VI.

There are a number of obstacles that we have encountered that we feel could threaten the enthusiasm and even willingness of municipalities to participate in our program.

The first relates to cash draw limitations. When Congress first passed the Water Quality Act in 1987, we believe it intended that all States would receive eight quarterly cash disbursements of their Grant Awards to capitalize the Revolving Loan Fund. This was the basis on which we supported the establishment of the State Revolving Fund and we were somewhat surprised and dismayed when the Office of Management and Budget determined that payment would be made in the form of Letters of Credit, rather than cash, and that we would be able to receive our funds only as reimbursement of incurred costs.

We in New York fought for a special provision called the "aggressive leveraging" option, which we have recently been notified by EPA we would qualify for, that enables us to get our funds on a cash basis over eight quarterly payments, but there are many, many, administrative hoops that we have to jump through to get this level of funding, and to get it in this form. We think this may be burdensome for other States and we encourage you to refocus on the issue of your original intent.

We are also concerned about restrictions in the law relating to the use of monies in the SRF for administrative costs. There is a provision that restricts administration costs to 4 percent of all Grant Awards. We are concerned that the concept of a leverage program, which will be implemented in New York and which will be used to issue debt and make loans equal to three times the amount of capitalization grants that we will receive, will severely restrict our ability to efficiently administer the program.

The cost of administration in excess of the 4 percent cap is going to have to be passed along to municipalities, in the form of fees and reduced subsidy, that we think is going to discourage participation in the program. This is, I know, a concern of many other States. A recent survey, conducted by the Council of Infrastructure Finance Authorities, found that 87 percent of all the States supported increased discretion to the States on this issue.

We would also appreciate it if attention could be paid to the term of loans—we believe that 30 years loans would be more attractive to municipalities than 20 year loans. Consideration should also be given to permitting the use of the Fund to support purchase of land. The curent restrictions will require municipalities to find other sources of funding outside of the SRF which will complicate their involvement.

There are a number of requirements that come to municipalities via the title II and the cross-cutting requirement that are imposed by the Act and by EPA interpretation of the Act. These add up, by our count, to about 40 requirements, 16 under title II and 23 under cross-cutting requirements. We are very concerned that trying to encourage municipalities to participate in this program, when they have to certify their compliance with 40 requirements in addition to some State requirements; in addition to the complexities of dealing with the municipal market, will be burdensome and will discourage participation in the program.

I would now like to just make a brief comment about combined sewer overflows.

New York State believes that EPA's current combined sewer overflows strategy represents a reasonable approach to address pollution control from this source. Our State policy which has been in effect since the 1960s, for dealing with CSOs, focuses attention on elimination of dry weather overflows and the control of solid and floatable materials in CSO discharges and is consistent with EPA's strategy. We, therefore, endorse and support EPA's approach.

The U.S. EPA Needs Survey Report, submitted to Congress in February 1989, shows an estimated cost of CSO control for all New York State municipalities of some $5.7 billion. We have identified, I think, about 70 municipalities with combined sewer overflows that require attention.

I would like to say that we are concerned about the cost of compliance and that we hope that this will be addressed and considered when you think about the authorized levels for the SRF Program under title VI.

Thank you very much. I would be happy to respond to any questions that you, Mr. Chairman, or members of the committee might have for me.

Mr. **Nowak**. Thank you very much.

We have reviewed your testimony and would like to thank you for a very comprehensive report.

Is there a State organization that New York and all the other States, through your DECs, are actively reviewing this law on an ongoing basis?

Mr. SULLIVAN. Yes, we are.

Mr. NOWAK. And is this, your testimony here, a synopsis of that review as of this date?

Mr. SULLIVAN. Yes, it is.

Mr. NOWAK. I understand 43 States have opted in as far as Revolving Loan Programs have now set them up?

Mr. SULLIVAN. That's approximately my understanding and we are moving——

Mr. NOWAK. And the other seven will be in within six months?

Mr. SULLIVAN. I believe that is correct.

Mr. NOWAK. That's correct.

The points you bring up, I think, are very valid and we will be looking at each one.

The Letter of Credit, of course, is something that I don't think was envisioned at the time the legislation was put together and was agreed upon—I understand, at least a consensus of the States said, they would try to work with it. I would be very interested in seeing how, as of this moment, it is working and the problems of trying to put together your programs using these letters instead of cash. I know that is not the only problem in the application process. I would like to see how that is working and any improvements that could be suggested as we move forward would be appreciated.

In some of your testimony, where you talk about the possibility of municipalities opting out, the Mayor that was here—I'm trying to elicit from him the kind of financing that can be obtained through a revenue bond instead of general obligation bond, whether it be the city, the State, or the county, or a sewer district, wherever. I am trying to compare that now, not to an 87½ percent grant, because there is no comparison, but certainly through the Revolving Loan Program, you would have to make some very hard calculations.

I would assume as your program is now being shifted through and the information is being processed, they will have to start making some decisions as to whether or not they even want to go with that program or float out their own "revenue" bonds. I think this issue is going to become of utmost importance as we look to the success of this whole program with the drastic change that you will now be working with. I appreciate your statements about trying to have this program actually bring about some of the goals that we are looking at, but I can't help believing that there are corrections that we are going to have to put into the law, or else you are not going to get the cooperation of many of the initiatives that you are trying to put in throughout the State.

Mr. SULLIVAN. Exactly.

Mr. NOWAK. Do you have any general feeling, even at this early date, as to what the response is going to be?

Mr. SULLIVAN. Yes, Mr. Chairman.

We have found a high level of interest in this program from municipalities, and our first issue will be for New York City, a very large $180 million issue that I think will speak to the——

Mr. Nowak. What kind of a project is that?

Mr. Sullivan. Well, it will be used for a variety of projects in the City, mainly waste water treatment plants, though the program is intended to use——

Mr. Nowak. Are the plants going from primary to secondary?

Mr. Sullivan. Secondary, right. Primarily for secondary treatment, though it will eventually be used for combined sewer overflows and for compliance with the Ocean Dumping Ban Act.

We envision a very comprehensive program for New York City, but also one that we want to be attractive for communities throughout the State. We intend to follow up the New York City issue, which is about a month away, with a pool financing for counties and smaller municipalities throughout the State. We also have a direct loan program for the smallest communities where the interest rates can go down to zero percent. The subsidy that will be available under the generic program is targeted for 33 percent—that is 33 percent of the market rates that each community would be able to obtain on its own in the market.

We will be able to generate some data that may be of interest to you comparing the SRF with revenue bond deals, particularly for New York City, because we are going to issue the debt on behalf of the New York City Water Finance Authority, which issues revenue bonds, and actually their security to us will be a revenue bond, so we will have some real good data to compare the performance of the SRF with the straight revenue bond deal in the municipal market.

Mr. Nowak. I'm concerned, as you mentioned in your testimony, about the different requirements if they did not opt for the program—that they could build out into—and what they would have to go through and the additional cost or time——

Mr. Sullivan. Exactly.

Mr. Nowak. That would have to be allotted to that performance and if they don't show a differential that is attractive, you're not going to be able to bring them in. I'm sure New York City will be well-taken care of—I'm worried about little towns like Buffalo.

Mr. Sullivan. Exactly. They are the ones who are going to suffer from the multitude of requirements that go with a federal, and admittedly, State program like this. The cost is important, though we have established this program to achieve a 33 percent subsidy. We are nicking away at that subsidy already with the fees I've mentioned. Because of the 4 percent cap, I think we are looking at $2 million in fees associated with this New York City issue. We are concerned about the time and administrative burden that will go along with compliance with all the requirements that we believe are well-intentioned, but problematic if you are a municipal official who has perhaps never issued debt, never established a credit rating and doesn't even have the kinds of accounting systems necessary to establish a revenue base for the program. When we are trying to draw them in and they are having to face bond counsel and financial advisors and underwriters—the whole works—with all these additional requirements, we are concerned that we are going to turn them away.

Mr. **Nowak**. I'm concerned that we do have, at least the differential, we've reduced this program substantially.

Mr. **Sullivan**. Right.

Mr. **Nowak**. At least what we have outstanding we want to function as well as it possibly can and still lead a community to putting in the highest priority they possibly can—a system that will work, and we are not going to have that incentive unless this program sells well.

So as you get through those initial details, the committee would be very interested in looking at how the add-ups picture in that differential, if they are not adequate, it is not only Akron or Buffalo, it's an awful lot of other communities throughout this Nation. I am sure all the States that have opted for the program would love to see it work now.

Mr. **Sullivan**. Yes. We are very committed to its success.

Mr. **Nowak**. Our first priority, and I have said this many times, is that we have got to fully fund the program. We have all kinds of exotic suggestions being made to this committee for treatment and when you look at your combined sewer overflow in New York City, as Susan correctly informed me, you have over 500 outlets.

Mr. **Sullivan**. Right.

Mr. **Nowak**. Five hundred outlets. By taking those outlets, and if we look at the ultimate treatment of course, you would have a treatment facility for every one of those outlets, or combination of those outlets, besides of course just combining the floatables that are coming out of there. There are a lot of other metals that I'm sure are leaching into your system through that overflow, that the floatables, or whatever mechanical nets you have established, and I saw a couple of them last year, aren't going to be effective against.

So there is an awful long list of things that we have got to pursue and I hope that at a very minimum we can make this program work so that we can look at some type of improvement very shortly.

Ms. Molinari.

Ms. **Molinari**. Thank you, Mr. Chairman.

Good morning, Mr. Sullivan. I am glad to see a representative from New York participating in such an important hearing.

With regard to the problems with the Federal Loan Program requirements, what are some of the most outstanding problems that you face as the State Administrator?

Mr. **Sullivan**. Well, I think there really is an excellent base program here that we are, as I have mentioned, absolutely determined to see implemented—to see effective. I think we have had a lot of cooperation from EPA and I really want to compliment them on their efforts to help us get through the hoops, as I said.

I think the Chairman is correct in identifying the level of funding as perhaps the most important one. I mentioned we have $9.8 billion in identified need in New York. New York is the largest recipient of grants, and was so under the Construction Grants Program, and is still under the SRF Program, and we have used the monies historically. We have more than $7 billion in treatment capacity that has been constructed under that program and so we have taken full advantage of that money and we will do so in the future. So if we don't have the level of funding necessary, then there is just going to be a tremendous level of unmet need, because this is, as we keep telling the municipalities, the only game in town.

I think we have focussed enough on the burdens and nature of the additional requirements, that is a concern obviously, and a key one. This cash draw limitation is a complexity that we are dealing with as we committed to try—but it is again an administrative burden.

The Letter of Credit system where cost would be incurred on a reimbursement basis, rather than on a cash basis, is not the original deal that we structured our program around and we have made accommodations to work around it. We have got sophisticated financial advisors and bond counsel that have helped us do that, but we are not sure that smaller programs in other States will be able to meet the requirements associated with qualifying for this aggressive leveraging option.

I focused in my testimony on this 4 percent administrative cap.

Ms. Molinari. Yes, I'm just curious along those lines, what would be a more realistic cap for——

Mr. Sullivan. Well, I think that what we would recommend is that the cap, the 4 percent factor, be applied to the level of loans that you make.

Ms. Molinari. Okay.

Mr. Sullivan. It is a very simple modification and I would like to point out that this has no impact on Federal revenues because it is basically an internal management issue—how do we manage our administrative costs relative to all the other costs that we are managing in relation to the program. So there is no federal impact and we think we should have some discretion there.

Ms. Molinari. Okay. So it's not a problem with the 4 percent, it is just what it is applied to?

Mr. Sullivan. Right. I think the concept was that most States would be just doing direct loan programs, but we have substantially increased the potential of our program three times just in the initial loans, and multiples of that, as we loan back the interest on that. So we think there is a real opportunity here to just say, "Okay, States, you've got the money; you've got the capability to manage this; you've got the full incentive to maximize the potential of your program;" and we want to give the maximum benefit to municipalities, and while New York City may be able to benefit from the program even with these fees, the margins will be narrowed as you get to the smaller communities.

I could mention a couple of other areas if you——

Ms. Molinari. Well, rather than take the committee's time, I would find it most helpful if perhaps you could just continue to delineate them while we go through these hearings over the next few weeks and provide them; if that's okay Mr. Chairman?

Mr. Sullivan. That's fine. I would be happy to do that.

Mr. Nowak. Thank you very much.

Mr. Laughlin, from Texas.

Mr. Laughlin. Thank you, Mr. Chairman. I have no questions.

Mr. Nowak. Mr. Geren, from Texas.

Mr. **Geren**. Thank you, Mr. Chairman. I have no questions either.

Mr. **Nowak**. Thank you very much and we will be back to you, Mr. Sullivan. We appreciate your time and certainly the detail of your testimony was excellent.

Mr. **Sullivan**. Thank you very much.

[Mr. Sullivan's prepared statement appears on page 734.]

Mr. **Nowak**. Now I would like to welcome before the committee, Roberta Savage, who is Executive Director and Secretary Treasurer, Association of State and Interstate Water Pollution Control Administrators.

Ms. Savage, we will accept your testimony in its totality and you may proceed as you so desire.

TESTIMONY OF ROBERTA SAVAGE, EXECUTIVE DIRECTOR AND SECRETARY TREASURER, ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Ms. **Savage**. Thank you very much, Mr. Chairman.

Before I begin my presentation, with your approval, I would like to introduce a young gentleman from Germany, who is an exchange student spending three weeks here in this country with my family, his name is ULF Lietka, and this is of course his first Congressional Hearing as well, accompanied by my youngest son Chad, and this is also his first testimony.

Mr. **Nowak**. They are welcome to join you at the table and give whatever testimony they would like to give.

Ms. **Savage**. Well, Chad has heard clean water since he was a baby so he could tell you a lot about, especially about nonpoint sources.

We appreciate, Mr. Chairman, not only the fact that you are holding these hearings, but also the tremendous leadership that you and members of this committee provided during the reauthorization of the Clean Water Act. As we go back and look at the record we find that if many of the suggestions of the House, yourself, Mr. Stangeland and others, had been incorporated in the final statute, many of the difficulties that we are facing today would probably not have become realities.

Nonetheless, there are a number of very key issues that are of concern to the States. In preparation for this testimony we have surveyed the 50 States and let me at the outset say, I support, and our members support, the presentation and statement of the State of New York, so I won't cover those same issues, but simply say please consider those in support of the testimony Mr. Sullivan provided.

There are several key areas that I would like to bring to your attention, the first of course is the old standby, State Management Grants. In the reauthorization of the Clean Water Act, and in pursuing the many new requirements that are incorporated in the 1987 amendments, we have come to recognize that with the funds that will be eliminated for State Management, with the phase out of the SRF, there will be a significant shortfall in the amount of funds available to the States to manage their programs.

In addition, of course, I will discuss the funding for State Revolving Loan Funds and then I will spend just a few minutes on the additional requirements for storm water protection, toxics and sludge management.

Also, Mr. Chairman, you indicated you would be putting together some form of data bank or information retrieval system—I offer our assistance at any time that we can be helpful, and if you would like us to survey the States, we would be pleased to do that.

In a recent ASIWPCA survey States, identified at least a need of $140 million to offset the reductions in Title II. The current program, estimated by the States to fully implement the Clean Water Act requirements of 1987, would be in excess of $600 million. So a $140 million by the Federal Government would be minimal at best.

We have, as one of your staff members pointed out, been critical on occassion of the Environmental Protection Agency and of the Administration for the Clean Water Act Implementation Program. However, I would like to congratulate the President for his wisdom in requesting additional funds for State Management Grants, understanding that there are many, requirements incorporated in the 1987 law, and the increase requested to $81.7 million is appreciated.

There is a $16.5 million increase in the President's budget. We appreciate that—any time they want to give the States more money, we are more than delighted to see it, but we would like to make sure that the administrative requirements attendant to that additional funding be as minimal as possible. To create a entirely new management program just to administer $16 million is a waste of the States' time, as well as your oversight.

In the area of State Revolving Loan Programs, you know as well as anyone, being one of the senior committee leaders, that as the State Revolving Loan Fund was conceived, it was a response to the Administration saying that the Construction Grants Program will end. There was never any question that President Reagan intended to kill the Construction Grants Program, and so working with the Congress, the States felt that a transition to some kind of program, which ultimately became the State Revolving Loan Program, was appropriate. The Governors in the States and the local governments, in that transition, accepted in excess of $83 billion in clean water needs. What they were promised was an $18 billion transition, flexible guidelines and directives from EPA, and a smooth transition. We have seen none of these three things.

Certainly, the funds have not been made available to the States. The requirements that have come from EPA are very complex and have become more complex with the changes in the Tax Act; and other requirements that have been imposed, for example, in excess of 25 separate cross-cutting federal statutes, that go from the Davis-Bacon requirements to historic preservation requirements, to minority business enterprises—many of these are social goals. They are important goals, but when you add them on top of requirements for loans as they currently exist, it is more than most small communities can handle.

I would call your attention to a document that I submitted as part of the record. It was an interview I did with Congressman Boland before he left Capital Hill for retirement. In that interview, he said that looking back over the discussions with Congress and the commitments made to the State and local governments, that in fact the State Revolving Loan Fund had been a trial of broken promises. Regrettably, we have to agree with that assessment. Congressman Mineta, indicated it was known as the "shift and the shaft." I suspect you can guess who is on which side.

We need full funding for the program as articulated by a number of your witnesses. At the very, very least the $2 billion level is essential to keep this program on target.

As you know, Mr. Chairman, a number of other environmental programs are looking to the State Revolving Loan Fund as a potential model for their future. If we don't have a successful program in the water area, what kind of model will we provide for drinking water programs, or solid waste programs, or as a funding mechanism in other others areas. So I think it is incumbent upon us to build a strong, workable program not only because of the requirements of the law, but also for the precedence that we are setting for our future in this particular program.

What we now have, based on the EPA requirements and those of the Tax Act, is an estimated increase in project cost over what you authorized of 20 to 30 percent. A decrease in the attractiveness of the SRF, especially in small communities because of all the requirements, and of course the Letter of Credit, has eliminated any potential for the States to accrue interest which was your original intent. The statute allows for direct cash to go into the State coffers and allow for the opportunity for interest to build at the State level to provide funding and perpetuity for local governments. The Letter of Credit has prohibited any accrual of interest in this program. Of course, as I indicated, program administration is tremendously complex—most of our state members would indicate that it is significantly more complicated than the Grants Program of just a few years ago. And of course, congressional intention was simplify the program, not make it more complicated.

I have listed a number of things that we would like to see happen in the area of technical amendments. We would also like to see the elimination of the application of Title II grant requirements once the enforceable requirements of the statute are met. During the discussion at the conference committee table, if I recall specifically Mr. Chairman, you asked that once the enforceable requirements or secondary treatment are attained in a particular State. States should be allowed to spend monies on other water related programs—nonpoint sources, combined sewer overflow, etc. It was our understanding at that time, and I think the answer to you was at that time, was "yes," as soon as secondary treatment is achieved and the enforceable requirements have been maintained, that a State could use those funds for other programs—we are not seeing that happen at the Environmental Protection Agency at this time.

We also had the understanding, and the covenant we thought we agreed to, was the elimination of EPA participation once the Grants Program had been eliminated. The Inspector General seems to have a different viewpoint, and indicates that if there is one dollar of Federal money in the SRF, the Federal Government has audit and review rights in perpetuity. We are very concerned about this aspect of the program.

Obviously, we would like to see the Letter of Credit eliminated.

We would like to see approval for, and determination of, compliance with the law, where you put it, "with the Nation's Governors and not with the Environmental Protection Agency." We would like to have you simply state for the EPA that they need to comply with the single audit provisions. That law was passed to provide flexibility for the States, and we think it is very important that if these programs are to be audited, that it be a part of the overall state audit.

As I indicated, approximately 25 cross-cutting laws have been imposed since the passage of The Clean Water Act. You have tax lawyers coming before you, I am not a tax lawyer, so I will simply say that we are having a significant problem walking through the maze of applicable tax law provisions that was not anticipated at the time that this law was passed.

The 4 percent for program management issue was raised by Mr. Sullivan, so I would like to spend just a minute on small communities. In this committee's wisdom the original SRF proposal had a small pot of money to remain as grants for small and hardship communities—as you know, in the Conference Committee, that was eliminated. This is one of the areas where I think if the wisdom of the House had been followed we would not see Senators and Congressmen from all over the country saying, "we need a new program to deal with small and hardship communities," it is becoming a significant issue and is talked about by every State. There has to be some kind of mechanism to deal with the small communities who simply can't even afford a loan under SRF.

In that regard, we are discussing something that I call the "parking place, " and this was raised to us by Congressional Appropriations Staff on both the House and Senate sides. I don't understand your budget process as well as I probably should, but the idea is that once the $2.4 billion of the Grants and Loan Program is eliminated from the budget as a line item, that line item can go for anything else—space station housing, whatever. The States would like to see that line item "or parking place" remain as an environmental line item, specifically in the area of water to deal with issues like combined sewer overflows, wet lands protections, coastal issues, ground water protection and so on. There are tremendous needs being placed on local governments and perhaps that parking place that has always been a clean water parking place could be reconfigured and provide a place in the budget to address these concerns of the future. ASIWPCA has formed a task force of States to look at this option, while we raise it to you for your consideration.

I will also say that there has been a group formed to advise the Administrator on funding. It is called the Environmental Financing Advisory Board, (EFAB). The EFAB group is a collage of experts in the field, I don't quite know how I got put on the committee, but I'm delighted to be there. Our task over the next several years is to analyze the barriers to successful financing of the SRF and other programs and to develop a guide book of funding mechanisms—the ones we know will work and the ones we are having problems with. We will share this information with Governors and other folks having to make tough policy decisions. We would also like to see EPA come up with some type of needs assessment—an environmental needs assessment. When we get into the appropriations process we often find that if you cut NASA by $100 million, they can tell you that the space station won't go up, but if you cut EPA by $100 million, we say, "well, the air might get a little dirtier, the water might get a little dirtier," but we don't have the basis, except in the Needs Survey for the Clean Water Program, to really argue the case for the environment of the future. So some kind of environmental assessment of what will happen if we don't fund these programs is needed, which I think is exactly where you're headed Mr. Chairman. The EFAB organization and Advisory Committee, I'm sure would be available to work with you.

I would like to spend just a little bit of time in the area of toxicity, storm water, and sludge. These are all major requirements of the Clean Water Program—tremendous requirements placed on State and local governments. We have very little direction from EPA on what their definition of an acceptable program will be. In addition we have very few opportunities to be flexible in the program without the fear that a State will be overruled at a later date. For example New York, has developed a very significant trail-blazing toxicity program for that State, and yet they are trying in advance of any significant guidance from EPA to build a program that can suit the needs of the Agency. This is a waste of the taxpayers money—it's certainly a waste of creativity if at some point, years down the road, USEPA can come back and say, "no that's not exactly what we wanted."

The same is true for the Storm Water Program—with tremendous requirements on local governments and the industries. We don't have the necessary guidance and direction from EPA to know what they consider an acceptable program.

Nonpoint is another area. Sludge, I'm sure you have heard a lot about the sludge problems and the lack of good science in the requirements as being charged by a number of scientists around the country.

We are very concerned with the imposition of requirements that lack the necessary science and attendant direction from EPA on what a good program is.

You will be hearing, I'm sure in the news over the next several months and years, the concern about dioxin—what's a good dioxin program—what is not. To make a determination will be very costly to the citizens of this country and we are very concerned about it.

Mr. Chairman, I would like to summarize with some issues dealing with the funding for nonpoint sources and the Nonpoint Source Control Program.

There are tremendous strides to be made in this area and the more we know about clean water, the more effective we become with the primary treatment, secondary treatment, advance treatment, and so on. The more advances we make, and the more we know about the water, the more we know needs to be done. We can detect to levels in the parts quadrillion, but we can't clean up to that level. As we find out more and more about the contributors nonpoint, is a significant contributor—in some States they say 50 percent. This is an area where we have been, not as probably out front as we needed to be. This is an area where we need to spend a lot of time and attention and we need to look at our institutional arrangements because we just can't go headlong into some one's back yard, or on a farmer's farm.

There are a lot of key issues and complications in nonpoint sources and we are delighted to see the Administration fund for the first time, or at least request funding for this program. Obviously, it is not enough to do the job that Section 319 requires us to do, but it's a start.

I have outlined some crosswalks for the Farm Bill and I have also incorporated as an addendum to my testimony some legislative suggestions that we made on the Coastal Bill.

I would like to turn just very quickly to America's Clean Water Foundation and the 20th Anniversary of the Clean Water Act, and thank you, Mr. Chairman, for your leadership.

I would like to invite you personally to come and be a judge and presenter at our 10K Clean Water Run which is April 21st on the Mall. If any of you are runners, any of the staff, or any of the members, we would love to have you.

One of our major successes is that the original authors of the Clean Water Bill, Senator Baker, Senator Muskie, Representative Blatnik, and Representative Harsha, have all agreed to be honorary co-chairs of America's Clean Water's Board of Governors. We are well underway with that program and, Mr. Chairman, we appreciate very much the leadership and the support that you have provided to the effort.

Thank you, sir.

Mr. NOWAK. Thank you very much, for your statement and certainly your testimony that has hit the high points in your statement. The 20K run, I hope all those people you mentioned are going to actually run.

Ms. SAVAGE. Ten are going to run 6.2 miles. We have a fun run too that's only a mile. Secretary Lujan is going to be there. I think he and I are going to do a 1K stroll—a very slow stroll.

Mr. NOWAK. A three yard dash, huh?

Ms. SAVAGE. Yes.

Mr. NOWAK. Let me ask you a couple of questions.

We have looked at your support and the State's testimony also. One of the things we did not cover with them, that we will try to do more, in the nonpoint source area in trying to determine how fast and how far we can go.

I think you rightfully pointed out that there has to be some analysis of what the benefits are for the loads that are coming into a particular body of water or stream. When you look at the tremendous amount of variances that are involved in that kind of analysis, it becomes almost an insurmountable kind of premise to first get at before you can start to make those other decisions as to what you are going to do about the nonpoint source.

We are finding out as we take a stream apart what the bottom sediment is consisting of and what the combined sewer overflows are adding to that load—that pollution load on an everyday basis—and what just ground water coming into the system is doing, and what run-offs—perhaps farms are producing some type of addition to the total pollution load 20 miles away is doing and how we try to analyze this is based—I think is going to have to be based upon a lot more technical information being focussed on the whole problem. We talk about the holistic look at the system of ecology and we look at a lake in its totality.

Do you have any general feelings about some of the areas that your members are involved with as to the nonpoint source contribution to the total pollution load in an area?

Ms. **Savage**. Yes, Mr. Chairman, a number of things and I am delighted to hear you talking about a holistic approach to environmental protection.

I think we are starting to hear at EPA, for the first time that I can recall I suspect since its creation, the opportunity to look at environment in its totality—to say that while the Air Act is being debated on the other side of the Hill, there are implications for the Clean Water Program through acid rain, which of course is a nonpoint source. Acid deposition is a major problem in the area of the country that you come from. Agriculture in our mid-west and some of our western States is a major, major issue. Acid mine drainage, in some parts of our country, is a major, major problem. It is not always the same issue, but the contribution of nonpoint sources is being found in basically every analysis that is being done.

You mentioned research and the type of scientific and technical data that is available. It is very weak at this point. At least in the area of bringing it to a central point where the professionals in the field can easily access and utilize that information for decision making. If you recall, we did an analysis of State Programs—the States Evaluation and Progress of Nonpoint Sources in 1985, but at this point of course, it is quite out-dated. It gives you some basic premises of what needs to be done, but it is not enough to make the kind of technical judgments at this point in time. That is an area where specific direction to EPA to maximize their role in what we always say technical exchange in assistance to the States. That is essential. It is foolish for every State to do the kind of technical analysis that is going to be necessary to control nonpoint sources and its various contributors. That would be of tremendous, tremendous assistance to the States if that could be an assignment to the Environmental Protection Agency.

Mr. **Nowak**. Thank you very much. Let me turn to Congresswoman Susan Molinari.

Ms. **Molinari**. Thank you, Mr. Chairman.

Let me just state initially, Ms. Savage, that that was a very thorough and in depth analysis and as a new member of this committee, I will go home and study your remarks very carefully and I thank you for the time that you put into that.

I would also like to state, Mr. Chairman, as a representative of the minority party here, that ~~I~~ have just been informed that there have been some members of the minority staff that have already signed up for your 10K race, and I myself, will see you on the fun run.

Ms. **Savage**. Good. We do have a number of congressional committees and of course, House Public Works and Water Resources—when that one came in I said, "right." We thank you very much.

Ms. MOLINARI. I would just like to ask one question that is not necessarily totally germane to the points that you raised, however, you represent a conglomeration of individuals that I have not had an opportunity to access this question with before.

With regard to the different grant programs and funding programs that are now available to States and municipalities, do you see any correlation to the success or the application of, say those grants, to the water and sewer rates? In other words, are the Federal Programs and the dollars that we are trying to put forth, despite all its problems, in some sense being realized by the rate payers?

Ms. SAVAGE. Absolutely. When you look at EPA's estimate, and the Need Survey's $83 billion in needs, the States would say probably that is just for waste water treatment. If you start looking at nonpoint sources, combined sewer overflow, wet lands management, ground water protection, and so on, you are in the hundreds of billion dollars of needs. So even though there has been a Grant Program which has been one of the largest capital programs in the country, it really has not been funded at a level that would provide for even staying close to the inflation rate. Certainly, with the lack of funding that has been attendant since the 1987 amendments were passed, it complicates the system even more. So yes, sewer rates are going up; user fees are being imposed; privatization is being discussed as an option—it makes some sense but legislatively we have a number of barriers to successful privatization opportunities, which our EFAB group is looking at, as well as lots of folks around the country, the Privatization Council and others—there are a host of opportunities out there but when you start following it down the track of okay there's no Grant Program, what else do you do—it always comes back to who is going to pay the bill and that is the American people. There may be ways that are less or more difficult for the American people to handle than others.

On the other side of that, when you look at paying for clean water, we pay more—I know my son pays more in a week for a video game, or going to get a movie from the local video store, than we pay in a quarter for clean water in Fairfax County. That's absurd that we don't pay enough for our water to think it is important enough to protect. We abuse it as Americans abuse a lot of things in our world.

The amount of water that we use in this country is quadruple what most other domestic nations use, and it is just so we can wash our hair and take three showers a day, and it's so cheap that we don't even think that we should treat it any other way.

So yes, when somebody tells you water and sewer rates go up, that's a significant political issue that all of you have to face. On the other hand, when you go to a movie and it's less than you pay for water in a quarter, you have to wonder if maybe we aren't on the wrong track in some instances.

Ms. MOLINARI. No, I don't deny that at all, and again, representing a city that is now going through a very intense water metering project we try and develop that mind set. With regard to water users I certainly agree. I am just wondering in the best case scenario, with some of those States who may have successfully accessed the Grant Fund, if that has been translated to the user?

Ms. **Savage**. It has in a number of instances and I'll use New Jersey, your sister State, as an example. They put together a program of user fees and permit application fees to fund their program. The problem in doing that, and there are opportunities all over Capitol Hill right now to Federally impose user charges and permit fees on the State and local programs, is once those fees were imposed, the State Legislature walks away from the program because they feel, okay, we've got that fee system over there, and your support base through general obligation bonds, or through the general appropriation in the State, dwindles away to nothing, and New Jersey says, that's of course one of the major problems.

Many States have worked 20 and 30 years to get that kind of support from their State Legislature and are very covetous of the fact that their funds for the program come from their State Legislatures—we don't want to see that undermined by the Federal Government. But, ultimately, the people of the United States have to pay for clean water—clean air across the board, if we could find a less harmful way to do that, I know they would all appreciate it.

Ms. **Molinari**. Thank you very much.

Ms. **Savage**. Thank you.

Mr. **Nowak**. Thank you again, Ms. Savage. We will be getting back to your organization as we develop—any further information that comes to your attention we would appreciate your advising us of those new kinds of experiences once your organization starts actually working with these loan programs.

Ms. **Savage**. Thank you very much, Mr. Chairman.

Mr. **Nowak**. Thank you.

[The prepared statement of Ms. Savage appears on page 708.]

[The prepared statement of Ms. Eichmiller appears on page 719.]

[ASIWPCA's interview with Congressman Boland appears on page 726.]

Mr. **Nowak**. Let us bring forward now from the Association of General Contractors of America, Samuel P. Hunter, who is the President of T.A. Loving Company, Goldsboro, North Carolina.

Mr. Hunter, your statement will be accepted in the record and you may proceed as you so desire.

TESTIMONY OF SAMUEL P. HUNTER, ASSOCIATED GENERAL CONTRACTORS OF AMERICA, PRESIDENT, T.A. LOVING CO., GOLDSBORO, NC, ACCOMPANIED BY BRIAN DEERY, NATIONAL STAFF, ASSOCIATED GENERAL CONTRACTORS OF AMERICA

Mr. **Hunter**. Good morning, Mr. Chairman, and members of the committee.

My name is Sam Hunter and I am a construction contractor from Goldsboro, North Carolina. With me today is, Brian Deery, with the National Staff of the Associated General Contractors of America.

I am here today representing AGC and its 102 chapters nationwide. AGC represents more than 32,500 firms, including 8,000 of America's leading general contracting companies which are responsible for the employment of more than 3.5 million individuals. These member contractors perform more than 80 percent of America's contract construction of commercial buildings, highways, heavy industrial and municipal utilities facilities.

AGC appreciates this opportunity to present its position on the important topic of reauthorization of the Federal Water Pollution Control Act. AGC calls on this subcommittee to increase the authorized funding levels for capitalization grants for the State Revolving Loan Funds during the remaining three fiscal years to a level which will allow for the recouping of funds which have been lost since 1987 due to appropriations below the authorized levels. AGC further calls on this subcommittee to authorize Federal capitalization grants beyond 1994.

When Congress passed the Water Quality Act of 1987, a very clear message was sent to the American public. The message was that clean water is an important factor in the quality of life and remains a primary goal that this country is committed to achieving and maintaining. In passing that legislation, tough choices were made. It was decided that the best way to continue progress towards the clean water goal is by transferring responsibility for the funding of this effort from the Federal Government to State and local governments. To ensure that previous accomplishments would not be undermined, and that progress would continue, a rational, reasonable phase-out of the Federal Program was instituted. The phase-out called for a gradual reduction in federal grants, and for the establishment of State Revolving Loan Funds (SRFs), to finance the program into the future. Federal seed money was to be provided to help States establish their SRF Programs. States were required to match 20 percent matching. Minimum funding levels were established to ensure continuity and a smooth transition.

Unlike the existing Construction Grants Program, the Revolving Loan Funds will eventually be self-perpetuating. Local governments will be required to establish user charge systems to pay back the loans. The repayment will go back into the SRFs, thus, providing money for future clean water needs. AGC strongly supports this congressional effort to continue progress toward improved water quality by compelling State and local governments to meet their obligations to pay the costs involved. This obligation of State and local governments is conditioned, however, on the Federal Government meetings its obligation to ensure that adequate capitalization funding is provided.

Unfortunately, this program has been subject to continuous underfunding since 1986. Over the past five fiscal years a total of $1.6 billion has been cut from the authorized levels contained in the Water Quality Act. The Administration's budget proposal for fiscal year 1991 request only $1.6 billion, a 33 percent cut from the authorized funding level of $2.4 billion. AGC is concerned that clean water progress will be set back significantly if this underfunding is not recouped and if the transition period is not extended.

Thus far, 44 States have established SRFS, and have been awarded capitalization grants by EPA. The vast majority of these States received their first capitalization grants within the last year. Even if a State were ready to immediately award all of the funds it received from EPA, as loans to local governments, for waste water treatment projects, it will be four or five years before repayments will begin to flow back into the SRFs. This is because loan recipients are not required to begin paying back the loans until one year after the projects have been put into operation.

Also, loans can be amortized over a 20 year period, which means that the initial amounts flowing back into SRFs will be small. Thus, in 1995, when federal capitalization grants are scheduled to cease, there is a real possibility that adequate funds will not be flowing into the SRFs to enable them to continue to make loans.

If this is allowed to happen there is a real concern that clean water progress will be undermined and there may actually be a decline in water quality. Waste water treatment needs continue to grow. While most of the major waste water systems are in compliance with water quality control standards, a significant percentage of small systems are not in compliance. In addition, many of the systems that were built in the mid-1970s, are beginning to approach the end of their useful lives and will need modernization, replacement and overhaul. Also, new water quality projects to control nonpoint source pollution and to correct combined sewer overflow problems will compete with the more traditional projects for the limited available funds.

Already there are signs that the Nation is losing ground in its effort to continue progress toward clean water. EPA's 1988 Needs Survey, which estimates the capital cost to build publicly owned municipal waste water treatment facilities to comply with the requirements of the Clean Water Act, documents $83.5 billion in facility needs. After accounting for inflation, this represents a nearly $3 billion increase in needs since the last survey was reported in 1986.

In conclusion, AGC fully supported the move to transfer the responsibility for funding the construction of waste water treatment facilities from the Federal Government to States and localities through a revolving loan fund mechanism. AGC remains fully committed to this transfer. However, AGC believes that some fine tuning is necessary to ensure that the SRFs are adequately funded to successfully carry on the program. AGC urges this subcommittee to increase the authorization for funding of capitalization grants for fiscal years 1992 through 1994, to a level that will allow for the program to be funded to the full $18 billion level anticipated in the Water Quality Act of 1987. AGC furthermore, recommends that this subcommittee authorize the continuation of capitalization grants for several years beyond fiscal year 1994, to ensure that there is not a sudden decline in loans available to localities, to help them meet their waste water treatment needs.

Thank you, Mr. Chairman.

Mr. NOWAK. Thank you very much.

Mr. Deery, do you have anything you would like to add at this point in time?

Mr. DEERY. No, sir.

Mr. NOWAK. Thank you very much.

We have been looking at some of the same problem areas that you have highlighted in your testimony and when we tried to analyze the one area that you mentioned here, the expected return on the various kinds of State Revolving Loan Funds, or commitments that they make in terms of what their out-years are going to produce in overlays of those returns, it's difficult because you don't know the type of programs and how fast the great variety of State Programs will bring back that money to be reinstituted into the program. Because of the variety, it looks like some States will have a minimum return, again depending upon what type of program is taken advantage of by the municipalities that are using the program, as you pointed out in your testimony.

I am just concerned too, that you have a huge shortfall in addressing the stream of problems that are going to have to be solved out there. In three or four years, or in two years after this program has ended, you will not have large enough returns to make renewed commitments to those communities. Where you may have everybody gearing up, including your organization in terms of man power and equipment, soon thereafter, if this turns out to be a minimal kind of program, there will be a huge shortfall in dollars out there to continue those commitments. So we will be looking at that and I have asked the staff to analyze that return of the revolving loan, taking into consideration immense varieties of conditions, and types of program loans that could go out and average out the kinds of returns you are going to have. I think when you look at the mandates that are down the line, and the improvements that we are going to ask the States and the communities to accomplish, you may not have nearly enough revolving loan match as some have projected earlier on in this program.

We would like to work with your organization to develop that—if you have any accounting analysis of that for the States we would appreciate it. We are also going to ask the States to do that to see, as they are getting into the program, how fast you do get a return and what we can look forward to in those years. It goes without saying, I agree, that we are going to make a full commitment to try to get that dollar level authorized, not only authorized, but appropriated and raise that, because I think the shortfall now, is going to mean a horrendous shortfall on that return. You can't base the program on a 2.4 authorization and then appropriate 1.6, then base your return on 2.4 which is never going to be out there—so in the same sense, using Letters of Credit. If that cash isn't up front you are not going to count that cash as a revolving interest payment, when all you have is the Letter of Credit mechanism, unless we change that. So you have got a lot of varieties that affect those final numbers out there. As you correctly point out, it may be a horrendous shortfall if you take all of that into consideration.

Thank you for your testimony, we have been looking forward to working with you.

Ms. MOLINARI. Thank you, Mr. Chairman.

I only want to echo your concerns, and thank the gentleman for bringing that issue, and highlighting that issue of the potential funding gap, and just what the ramifications upon this program down the line may mean, to our attention this morning in a very clear and concise manner.

Thank you.

Mr. HUNTER. Thank you.

Mr. NOWAK. Again, thank you very much and we will be looking forward to more correspondence as we move forward with that analysis.

Mr. DEERY. Thank you, Mr. Chairman.

[Mr. Hunter's prepared statement appears on page 652.]

Mr. NOWAK. I would like to bring before the committee, Dr. Peter Maier, who is the Intermountain Water Alliance representative.

Doctor, if you would like to take a seat your testimony will be admitted in the record in its totality for the benefit of all the other members and we will let you proceed as you desire.

TESTIMONY OF PETER MAIER, INTERMOUNTAIN WATER ALLIANCE

Mr. MAIER. Mr. Chairman, members of the subcommittee.

I would first like to thank you for allowing me to address this subcommittee. My name is Peter Maier, I have a doctoral degree in Civil Engineering from the University in Delft in the Netherlands. I have a Professional Engineering License from the State of Utah and a dormant one from the State of New York. I have worked in the field of sanitary engineering for many years and was directly involved in the design and construction of sewage treatment facilities in several countries. I also was actively involved in research and development projects in Europe as well as in the United States. This should give me some credibility, believe me, I'll need it after you hear my statement.

The Clean Water Act of 1972, as passed by Congress, is not being implemented by the EPA due to the fact that the Federal Regulatory Program uses the BOD pollution test incorrectly. BOD stands for biochemical oxygen demand. The Federal Regulatory Program ignores 35 percent of the water pollution caused by fecal waste and 100 percent of the water pollution caused by urine waste. It ignores 65 percent of the water pollution caused by sewage.

The Congress promised the American public in 1972, that all water pollution would be eliminated by 1985. Now in 1990, 18 years later, our open waters are still used as urinals for our cities. The Clean Water Act also authorized the EPA Administrator to achieve the goals of the Act by demanding best available technology. Best available treatment technology in 1972 was 95 percent treatment, but the EPA Administrator currently only demands 35 percent treatment.

The incorrect use of the pollution test also made it impossible to enforce the Federal Program; treatment facilities could not meet their discharge permits, simply because these facilities were treating the sewage better than was required. In 1984, the EPA recognized this problem and modified the regulations by allowing a different test, the inhibited BOD test. This test simply does not measure the water pollution caused by urine waste. This test brought most of the facilities, earlier considered out of compliance, into compliance with their discharge permit. Prior to 1984, communities with facilities considered out of compliance with their discharge permit would be forced to modify or construct a new facility, and were actually penalized for treating the sewer better than was required.

By changing the rules in 1984, the EPA at least would not penalize a sewage treatment facility for treating the sewage better than was required, but at the same time, the EPA officially ignored 35 percent of the water pollution caused by fecal waste and 100 percent of the water pollution caused by urine waste. The lack of urine treatment has been disastrous for the Federal Program. Urine first is biochemically oxidized into nitrate which process exerts an oxygen demand in open water. Then, as a nitrate, it becomes a fertilizer for algae growth, which not only contributes to the eutrophication of lakes, but also creates all types of problems in wetlands, bays and oceans.

The incorrect testing also causes major problems with the designs of sewage treatment facilities. Facilities were basically designed for the wrong type of waste. Therefore, it is not surprising that so many problems are experienced with the operation of sewage treatment facilities.

To add insult to injury: If the EPA had demanded best available technology, as so clearly directed by Congress, most sewage in this Nation would by now have received 95 to 98 percent treatment. This would have cost the public half of what it pays now for a meager 50 to 60 percent treatment.

Utah State's Science Council evaluated the BOD issue in 1983 and recommended in 1984 that the BOD test should be properly applied. After a six month period the council would evaluate the State's Water Pollution Program with the new technical data. The governor rejected the council's recommendation claiming that this would violate Federal EPA policies.

As long as the EPA does not require correct testing, the water quality in our rivers, bays, and oceans will only deteriorate further, and the Nation will continue to pay a very high price for treatment facilities that do not provide adequate sewage treatment. Achieving the interim goal of the Clean Water Act, swimmable and fishable water, is possible. The only problem is that it is not in the interest of the specialized environmental-industrial complex, which presently has a monopoly on the knowledge needed to evaluate the projects it proposes and builds.

Last Saturday, the President of the Intermountain Water Alliance, read my testimony and asked me, "Peter, it's still too technical. You're talking about milligrams per liter; you're talking about percentages; they don't understand that; can you prepare a bar chart?" I have prepared the bar chart which I hope you have in front of you, but meanwhile, I thought of something else to demonstrate what is wrong with the program.

Here is the BOD pollution as is in sewage. You guessed it, the right part is the fecal waste, the yellow is the urine waste. Secondary treatment, although there is no scientific definition for secondary treatment, would be about this much treatment. EPA in its rule change of 1984 had a problem with secondary treatment because they started realizing how less waste there was treated. So they came up with the inhibited BOD5 test which basically leaves this much pollution into the sewage, after it's treated, in a secondary sewage treatment plant.

This is the amount of pollution that's possible—that's available technology. That is all there is left if the city sewage treatment is properly designed and operated.

I'm simply a messenger of some bad news. Some emperors in the past killed their messengers that brought them that bad news. I sincerely hope that you will act differently. I hope that you will force the EPA Administrator to implement the Clean Water Act as it was promised to the American public, and as it was so clearly intended in 1972.

I thank you.

Mr. Nowak. Thank you very much, Doctor.

We have had the opportunity to look at your survey of what is happening out there under this Clean Water Act and I assume you have had the opportunity to, on more than one occasion, talk to the chemists and experts that EPA and—you're telling us you have not. Have you written—have there been any other——

Mr. Maier. I started with——

Mr. Nowak. Survey of your proposal?

Mr. Maier. Well, first, Mr. Chairman, it's not a survey, these are facts that can be read in every text book of engineering. It is not of my own making. I have contacted the EPA and started with Administrator Gorsuch, then Ruckleshaus, then Thomas, now Reilly. I have got some response from some environmental engineers working for the department, but I have never had the opportunity to discuss this, they have never invited me, they have never wanted to discuss it. I agree this issue should not be in this chamber here. This issue is a professional issue, it's a scientific issue and it should be discussed on a professional level. Unfortunately, I have discussed it with the Water Pollution Control Federation Chapter of Utah—there was no action.

Mr. Nowak. I'm sorry. What was that, the Water Pollution——

Mr. Maier. The Water Pollution Control Federation. It is amazing how fast people become unexperts when you start talking technology to them.

Mr. Nowak. These are your fellow engineers; is that correct?

Mr. Maier. Right.

Mr. Nowak. The Water Pollution Control Federation?

Mr. Maier. That's right. In the last nine years I have probably made Postal Office rates by writing letters, my response rate is about one percent, and even not that much.

Mr. Nowak. The Water Pollution Federation came before us a couple of weeks ago and asked that they receive a research foundation grant, if you will, for an extensive assessment of what is going on in this whole field. I would think that they would be interested in looking at your—at this point I guess we will call it a theory of terrific reduction, but when you look at the experts in the field, we would at least like to have an acknowledgement that they have studied and they have looked at your proposal, whether or not it meets it, at least have a response for us. Perhaps we will try to obtain a more definitive response for you as we contact EPA.

Mr. Maier. By the way, Mr. Chairman, the Science Council of Utah, State Science Council, evaluated the same issue and it took them about six months to evaluate and it came out with the recommendations that the test should be performed properly.

Mr. Nowak. What was this State?

Mr. Maier. The State of Utah.

Mr. Nowak. The State of Utah and do you know the correct title of the organization?

Mr. Maier. It was the Governor's State Science Council.

Mr. **Nowak**. The Governor's State Science Council. Have they got a paper on this that you can submit?

Mr. **Maier**. Yes. I can show you the agenda. It was first evaluated by a subcommittee and then I presented to the Council itself and then they passed the resolution that it should be recommended to the Governor, and that after a six month period with the new technical data, they would evaluate the State's Priority Program and the State's Water Quality Management Program, but as I said, the Governor rejected the recommendation claiming that it would violate EPA policies and the value you can put on it yourself.

Mr. **Nowak**. Okay. Let me turn to Ms. Molinari for any questions she may have.

Ms. **Molinari**. I have no questions, Mr. Chairman.

I just want to thank the gentleman for bringing some very serious accusations to our attention and it will be interesting to see what EPA's reaction and reflection upon a lot of your assertions are, and certainly we will have a basis upon which we proceed.

Thank you.

Mr. **Maier**. I can answer one, and that is EPA says that technically I am right, but I don't understand the Regulatory Program. That is all of the remarks I got.

Ms. **Molinari**. Thank you.

Mr. **Nowak**. Thank you very much.

[Mr. Maier's prepared statement appears on page 657.]

Mr. **Nowak**. Our next witness will be Mr. Ralph Petroff, who is President of ADS Environmental Services and he is accompanied by Peter Petroff, who is the Chairman Emeritus, ADS Environmental Services. Welcome gentlemen to the subcommittee and we will accept your written statement into the record and please proceed as you so desire.

Mr. **Petroff**. Thank you. If you give us just a second I'll get this easel set up.

Mr. **Nowak**. All right.

TESTIMONY OF RALPH PETROFF, PRESIDENT, ADS ENVIRONMENTAL SERVICES, ACCOMPANIED BY PETER PETROFF, CHAIRMAN EMERITUS, ADS ENVIRONMENTAL SERVICES

Mr. **Ralph Petroff**. Yes. Thank you, Mr. Chairman and members of the committee, for inviting us to appear again before the Water Resources Subcommittee.

My name is Ralph Petroff and this is my father, Peter Petroff. I am President of a company called ADS Environmental Services, out of Huntsville, Alabama, the home district of one of your previous Chairmen, Mr. Bob Jones. Our company has performed over 3,000 municipal sewer studies in the United States and Canada. We collect computerized sewer flow data from many points from within a sewer system to determine how actually does that sewer system operate. In a sense, our company serves as sort of a "flow monitor" in this whole sewer program. We have monitored tens of thousands of manholes, separate sewers, combined sewer overflows and have an extensive data base.

Today we are here to talk about two problems: Combined sewer overflow, and I think potentially a far more serious problem, raw sewer overflow. We are also here, I think, to offer two solutions on how these problems can be dealt with.

Before I go on I would like to have my father say a few words. He has had a distinguished, scientific and business career. He has built engineering projects all over the world, he ended up in Huntsville, Alabama, as R&D Head for the Apollo Moon Rocket Program and after that he invented a host of interesting devices, including the first digital wrist watch, digital heart monitoring systems and a variety of high tech pollution monitors.

Pops?

Mr. PETER PETROFF. Thank you, Ralph.

Well, I am Bulgarian, so please bear with my English, it is not the best. Perhaps I can contribute something, in my old age I am beginning to be more philosophical than technical.

I understand the subject of this meeting is to talk about combined sewer overflow. I also understood that we are talking in the range of $100 billion. "B" like in boy. My son will discuss how possible it is to reduce the $100 billion to something much lower.

Actually, I want to talk about something else—American impatience for getting quick results. Impatience is a great feature without the weakness. Impatience helped America put a man on the moon on inventive computers way ahead of any other nations, also into world wars. The same impatience makes us also throw money on any problem which comes along often with skimpy results. Just look at the social problems which we have and the money which is spent on them. So let me give you a few technical examples on this impatience and how easy things can be solved with a little bit more patience.

I was working on a radar system around the North Pole, what they call at this time the DEW line. We had those huge antennas, hundreds of them, and they were supposed to tell us when the Russians were coming with the bombers. Unfortunately, somebody didn't think that we were in 40 degrees below zero, so the gearboxes kept freezing, so we couldn't move the antennas. Fortunately, instead of initiating some multi-million dollar program to redesign the system, we just used antifreeze instead of recommended gear oil and it worked okay. A second thing which I participated in—in the 1950s we built Explorer moon rockets, some 60 of them. We built them until we started testing them. Thirty-four worked, the rest of them just created terrific elimination for Cape Canaveral. Again, panic. We had to do something different, we had to spend much more money or we were going to lose the space race to the Russians. Again, lots of billions proposed to solve the problem which happily, when we started building the next set of rockets, we tested the components first to make sure they would survive from the vibrations—and can we build them and put man on the moon in ten years.

The third is the Construction Grant Program. In 1981 the GAO said that 90 percent of all sewer treatment plants do not meet permit. The Washington Post says that sewage treatment plants are "monuments laying rusty in the mud." Again, panic, hysteria, multi-million dollar solutions were proposed. The Yogi Berra deja vu thing again.

Now, in 1990 we have the fourth example, combined sewer overflow, again multi-billion dollar solutions proposed. Some people think these, like our Stealth bomber, may or may not work. I think this is more like the French Maginot Line. Build it and we are protected from the Germans. Well, it didn't work this way, it just gave the French a nice cozy feeling and the Germans just got around and took care of them. So if a CSO is built on a Maginot Line, we will spend a great deal of money and it will give us a false sense of security—environmental security, to be outflanked by a much more serious problem. The problem is RSO, raw sewage overflow, a little known problem with enormous potential for mischief.

So I would like to recommend to this committee to please have patience, resist the temptation to throw money at the CSO problem. The problem is not that great, but there are other bigger problems hiding in the wings, but there are simple solutions to the problem, there always are.

Thank you.

Mr. RALPH PETROFF. I'm going to attempt to do this standing up; can you hear me okay?

I have three things to talk about today—what are the present costs and benefits of CSO; an approach that can dramatically lower the costs; and then create awareness of this little known problem.

Let's first talk about the cost and benefits of present CSO approaches, and specifically first on the costs. If we take a look at those costs, this is a chart showing the State and local share for the money that has been spent on the Public Works Program. This is the local share for the Interstate Highway Program. This is the local share for the Sewer Construction Grants Program, and this is the projected CSO control costs—$100 billion. Now, that $100 billion is obviously far greater than these two numbers and significantly, these two costs were borne by 20,000 cities and we are asking the CSO control cost to be borne by only over 1,000 cities. Most of the older cities don't have that kind of tax bases. What are the benefits of CSO control? I don't think anyone really knows what the benefits are. Not all CSOs are created equal. Some CSOs have a significant water quality impact and they should be very aggressively addressed. But, there are many CSOs that have marginal, negligible or no water quality impact. They should probably be left alone. Unfortunately, the control strategy that is developing here is that all CSOs are bad and they all must be taken care of. If we do that, you can look at this number going up to the $200 to $300 billion range.

It is important when we focus on this problem of CSOs to remember that CSO is just one small piece of a much larger puzzle, and that larger puzzle is the wet weather problem—the overall wet weather problem from what we call point sources.

There are three components to this problem. There is the CSO problem which you have heard much testimony about; there is also the storm water overflow problem, which EPA is addressing; but then there is, I think ultimately the biggest problem, RSO, raw sewer overflows.

What does a raw sewer overflow look like? It looks like this. This is an example of a raw sewer overflow that is not too far away from our office. Well, I probably shouldn't have said that. We call this manhole "Old Faithful" with every rain it can be almost guaranteed to start spouting off like this.

Now, how bad of a problem is RSO? We say it's bad. How bad is bad? Nationwide, if there are 20,000 CSOs, I think a good estimate for RSOs is in the neighborhood of ten times that amount, or perhaps 200,000.

Let me just digress for a second and talk about the two different kinds of sewer systems.

We have combined sewers that were built, perhaps a century ago. They carry a little bit of waste water and then when it rains they fill up with storm water and they go out through regulators and a lot of this flow is captured and sent to the plant, some is discharged. When this discharge is excessive, that is a bad CSO, if it is not excessive, then it's a good CSO.

You also have separate sewers. The separate sewers are built more recently. One is suppose to carry just the sanitary waste and one is suppose to carry just the storm waste. Now here is the problem—when the storm sewer fills up, it produces a storm water overflow—that's not too bad. However, when the sanitary sewer overloads, it produces a raw sewer overflow.

Let's focus in on this pipe again. This is a typical pipe, it is running half full, sanitary sewer system, this is the component of waste water flow—sewage—and this is the component of ground water infiltration. Now, when you get a rain, you get inflow into these sanitary sewers. Again, it is not suppose to be there, but it does get in there and that inflow causes those sewers to fill up and then causes them to overflow like this.

Just to give you a comparison of CSOs and RSOs—Nationwide CSOs, there are about 20,000 of them—RSOs, 200,000 is our guess. That number may be 100,000, it may be 300,000, but it is certainly somewhere there. Every city in the country has a number of these. Now if you look at the water quality impacts, this again is more significant.

A combined sewer overflow is five gallons sewage and 95 gallons of rain water, whereas a raw sewer overflow is 30 gallons of sewage and 70 gallons of storm water. So the impact from raw sewer overflow is much more concentrated sewage. We are not talking about a little bit of sewage and a lot of storm water, we're talking about a lot of sewage and some storm water.

Another line that should be put in here is types of receiving waters. CSOs discharge into lakes, rivers, oceans, big bodies of water. RSOs on the other hand, discharge into small creeks, ditches that don't have the—what's the phrase—the assimilative capacity of the big ones.

The cost of correction of CSOs is very high and for RSOs is very low.

A couple of rules of thumb on combined sewer overflow cost—we have heard a number of different things; we've polled a lot of our clients and this is what we have come up with—$10 to $50 million per square mile of sewer, that's combined; $1 to $5 million per CSO structure, which if you think, Congresswoman Molinari, about New York, 500 overflows times $4 million a piece, equals about $2 billion, so that's right in line; or $1 thousand to $5 thousand per capita. Now, there is a hidden cost in all this too. This is per capita construction cost. Anything that is constructed you have to say 10 percent of that cost is operation and maintenance cost that you are going to have to spend year after year. So you can think in terms of $1 hundred to $5 hundred a year in operation and maintenance costs.

Just to put it in perspective, Mr. Chairman, I read in the paper yesterday about the Buffalo Transit System. The Buffalo Transit System was shutting down because of a shortfall of $9 per capita, and yet we are asking cities to bear the brunt of $5 thousand per capita and maybe $5 hundred per year for ever and ever for O&M.

Little cities, New Bedford, Richmond, are talking about spending a quarter billion dollars to achieve compliance. Smaller cities like Columbus, Georgia, Saginaw, Michigan, they are talking about spending $80 million, $90 million to try and achieve compliance. The cost will be, far and away, the most expensive Public Works Program of all time. This is a CSO regulator. It is a complicated thing that is suppose to keep the sewage out. Some of these work very well—some do not. The ones that don't work well, we should spend money on them. The ones that work well, we probably shouldn't spend the money on them. Again, all CSOs are not created equal.

Now one of the dangerous trends is on the part of the States. The States, I can think of three of them, have had new laws come up that outlaw all CSO discharges, and so many CSOs that are not a water quality problem, may end up getting fixed, even though there is not a problem. There are so many pressing problems that we have, it just doesn't seem right to spend the money on areas where it will have negligible impact, especially with the dollar volume that we are talking about.

So what's the solution to combined sewer overflows? I think the solution is what my father alluded to—patience. Take a closer look at the actual water quality impact on the receiving waters. Don't assume, don't model, don't project. Measure it, monitor it, determine exactly the load of pollutants that is getting dumped into that body of water, and then make a decision—is it a water quality problem or not.

Let me give you a couple of examples. The City of Chattanooga was looking at $80 to $100 million to spend on CSO control. They went out, measured their overflows, determined the water quality impact, and found out that only a handful of their CSOs were really causing a problem. Fix those, forget about the rest because they had no water quality impact that was measurable and you reduce your cost from here down to the $40 million level.

Columbus, Ohio, even a better example. Here is a city that dumps combined sewers, four dozen of them, into this tiny little stream, the Olentangy River. The Olentangy is so small that they need to have an advanced waste water treatment plant to handle all the flows. So we are talking an environmentally sensitive stream here. The City of Columbus measured all of its overflows, they determined the water quality impact and found out that only a handful really made a difference. So their projected costs of $250 million, which is about par for the City of Columbus' size, went down to $45 million. Most significantly, they found that the real water quality problem did not appear to be coming from the sanitary sewers, it appeared to be coming instead, from the storm sewers. I'm sorry, combined sewers—it instead came from upstream storm sewers.

So the recommendation to improve CSOs—be patient. Give people a year or two to really study the problem. I know it's not fashionable to talk about studying the problem instead of going out there and fixing it, but when you are talking about $100 billion a little bit of studying can go a very long way. Maybe a billion dollars spent measuring water quality could—easily as one percent of the money—could easily have a significant impact on those dollars—maybe even knock a zero off that $100 billion number and I am being deadly serious.

So do this water quality impact study prior to going out and designing and building and determine the actual water quality impact, not the theoretical water quality impact. There are too many extrapolated, derived, assumed and presumed numbers floating around there. The way to do that is to monitor all the CSOs, not just the worst two or three. If you measure the worst two, three or four, you get a very distorted picture and you tend to have projects with another zero on the end of their construction costs.

Perform regular maintenance on CSOs—a very simple thing—just a little oil on some of these old combined sewers, they work very nicely and then use innovative CSO control technology, there is a lot of it floating around. The Europeans have been doing CSOs in a very sophisticated and effective manner for a number of years.

Now let's talk for just a moment about the problem here with raw sewer overflows and get into a little bit of background. Again, potentially, I think raw sewers are a worse problem than combined sewers.

What is the cause of the wrong sewer overflow? It's our old friend's infiltration and inflow. This is a chart showing how much of the flows in the country are ground water infiltration. About 45 percent of all this flow in the plants in the U.S. is infiltration. EPA argues about that, last time they said it was 42 percent, but we're very close—55 percent is sewage, so half of the load at treatment plants is being used to treat ground water, and then when it rains and we have a situation where rain water gets into the sewers—into the separate sanitary sewers, in a typical city, typical of the 20,000 separate sewers out there, the average is about the tripling of the flow and when you triple the flow in a pipe that is half full, this is what you end up with.

Just to give you an idea, we checked the newspapers to find stories on raw sewer overflows just in the previous week and we came up with a number of these that are included in the testimony. Just a couple—"L.A. Officials Dump 8 Million Gallons in the Santa Monica Bay when Storm Swollen Sanitary Sewers Threaten to Overflow Into City Streets."—"Fairfield Outlines Plans to Resolve Sewer Back-Ups." "Sewage Spills Into Parking Lot." "Sewer Plant Near Capacity. Council studying water infiltration problem." "Rain Forces Dublin Plant to Leak Sewage into Scioto." "Old problem strikes anew: Sewage flows into Sound." "Rain swamps Lincoln sewers." My personal favorite, the hanging in effigy of a former member of this committee. Mayor Boner, a distinguished member of this committee who is now the Mayor of Nashville and whose people by the way, I think, are on the cutting edge of raw sewer overflow control, they do a great job, was hung in effigy here in February.

Nashville is also like many cities in the country with a sewer system too small for its load of customers. It also has aging pipes that allow infiltration of rain water to further overload the treatment plant. So it's definitely a serious problem, and again, let me say this is a most unfair attack on a man, who I think has accomplished a lot of good, with Nashville and the Nashville Water Services.

Let's talk a little bit about the solutions. Take Indianapolis—I think one of the classic cases. In 1986, every time it rained in Indianapolis, they would get 4,000 reports of sewer basement flooding. These 4,000 basement floodings caused a sewer moratorium. In order to correct the problem, they were looking at perhaps five years worth of construction. They didn't have the time for it, so they went in and said, "let's correct the infiltration and inflow." What happened? The flows were reduced from 22 million gallons down to 14 million gallons. Basement flooding was virtually eliminated. The moratorium was lifted and all this took only 11 months, and it cost only $3.2 million.

I think so many of the problems in this program can get back to infiltration and inflow that cause these raw sewer overflows—that cause the almost 800,000 sewer basement floodings that occur each year—800,000 of them. For too long our strategy has been you've got a lot of infiltration and inflow, let's build another big pipe right next to it. That's like saying, well we've got a highway over here and this highway has potholes, so let's build a new highway right next to it. You need to fix the potholes on the highways and infiltration and inflow are the potholes of sewer systems. Instead of building new highways—new pipes, let's just fix a number of these potholes.

So to summarize—CSO, far and away, the most expensive Publics Work Program—the cost that would be borne on just the shoulders of a few cities and with water quality benefits that are marginal in many cases, some they aren't, many they're not—if we study them, do detailed water quality studies, we can significantly reduce those costs and we need to address somehow, this issue of RSO which I think may be far worse of a problem than CSO and look at the whole wet weather problem as an integrated piece instead of looking at CSO's now, then looking at SWOs and RSOs in the future.

Thank you very much.

Mr. NOWAK. Thank you for a very practical run through of the problems. As you were going through—your company has provided, I take it, the wherewithal in terms of its equipment to measure flows from CSOs and all the other nonpoint sources and I would suppose all point sources that are measurable. You mentioned that you have done this with some considerable success in reducing capital outlays after an analysis of those kinds of outflows. I think the points you make are very valid. My general question, as you were going through your testimony, was regarding the engineering firms that are hired for these cities for the overall evaluation of the plant and everything else; do they take advantage of your services or at least have the ability to get the measurements before they recommend these very expensive alternatives for the capital construction solutions?

Mr. **Ralph Petroff**. Excuse me. Some do and others do not. One of the things that is making CSO difficult is the time frame. Some cities are caught in this Catch-22 where they don't have time to do a water quality study because they will have fines in the very short future. So I think we are forcing them to spend more money than they really need to. We are not allowing that time to reflect and the time to find out what's really going on.

Mr. **Nowak**. Well, it would seem to me that every jurisdiction that is under pressure, in order to make a valid decision, would have to know those flows: In the Buffalo River, we're starting to measure now to look at the impacts of 16 combined sewer overflows that are going into the Buffalo River because we are trying to do something with the bottom sediment that is in that river. We will be starting that testing in the spring and continue it for six months or a year. I think six months is the time frame on that testing which will give you both dry and wet events as we go through. I think only then we will be able to know what real impact that is having on the total pollution load of that river—I don't know how else you can do it.

The equipment that you're designating here, I assume, is something that is installed right into the pipe or the outflow and has the ability to measure various levels of pollution?

Mr. **Ralph Petroff**. Yes. You want to measure the quantity of the discharge, the frequency of the discharge, the duration of the discharge and then the water quality of the discharge as well as what is the water quality impact on that river. Those are the five things you want to measure.

Mr. **Nowak**. While measuring that, are there costs associated with one? Is this a standard piece of equipment that can go in?

Mr. **Ralph Petroff**. No, unfortunately, CSOs are so site-specific, they are all different. It has to be almost a custom type of installation. It is expensive and difficult to do them and I think that's why cities do so few of them.

In the case of Buffalo, I don't know what the total number of CSOs are in Buffalo, but I would expect that it is probably in the many dozens. If you would monitor all the CSOs in Buffalo, I think you would get a much different picture than if you just monitor a portion of them, because people tend to spend their money on the biggest CSOs, which are ones that have the most problem and then they take those results and start extrapolating them out for the rest of the CSOs.

Mr. **Nowak**. Well, the point you made about all CSOs not being equal, they are probably as unequal as you can get. If you go on a rainy day and stand outside of a CSO on the Buffalo River, you will see a clean flow of water go through. You can go to the Niagara River and stand beside one and all you see is the accumulation and the dirt and the raw sewage being poured in. I would bet, if I were going to measure those, I would come up with vastly different numbers.

Mr. **Ralph Petroff**. Oh, you bet.

Mr. Nowak. So you can't, as you say, eliminate the tough ones or if you do you are going to get a skewed kind of a total result that is coming into your system.

It was very interesting. Thank you.

Susan, do you have any questions?

Ms. Molinari. Yes. Just one. When you say with regard to your five point plan for determining the affects of a CSO and the last step I believe was measuring the water quality after an outflow—at what point in the river or say ocean would you measure it?

Mr. Ralph Petroff. You would—again, it's very site-specific. If you were measuring in a river, you would need to measure before the combined sewer part of town and then maybe in the middle of the river, one, two or three points along the river, and then at the last CSO, so you could monitor the change in water quality as the flow goes by.

Ms. Molinari. Follow it. Okay.

Mr. Ralph Petroff. It's a lot tougher if you are talking about areas that have tides that surge back and forth.

Ms. Molinari. That would be my concern with regard to it. Certainly, in my part of the region where, you maybe able to go an hour or two hours later and measure the water quality within even maybe a half a mile, or a mile of the CSO, but with the tide being so rapid, it sometimes takes it five or six miles away where you would really feel the impact with regard to, high fecal count or whatever.

Mr. Ralph Petroff. That's right. I've seen some of the CSOs that you're talking about and some of them are a mess. I remember the Mayor of Akron testifying earlier today and I have been in many of the sewer regulators in the City of Akron, and I can report that the engineers of 100 years ago who designed them, designed them very well. They will hold the first two or three hours worth of flow and then the spill over, if it occurs, is very clean water. So they shouldn't have to spend $5 million per overflow in Akron. They might need to in New York. Again, it is site-specific, but this dangerous notion that all CSOs are bad, and we've got to stop all of them, will not give us a $100 billion program, it will give us a $300 billion program.

Ms. Molinari. Who determines which CSO is more dangerous or not more dangerous? Would it be the Federal Government or the States or the municipalities?

Mr. Ralph Petroff. That is an interesting question. It would be the municipalities and their engineers, consulting engineers, subject to the oversight of EPA and it gets to the point of, where do you draw the line at what is a bad sewer. If you draw the line low enough, then all sewers are bad and I think that is the kind of thing that is happening.

Ms. Molinari. Because clearly, Federal oversight notwithstanding, and Federal Grant Programs available notwithstanding, there would be a borne prejudice for a municipality to conclude that the majority of their CSOs were up to standards.

Mr. Ralph Petroff. Yes.

Ms. Molinari. Just one last question. When you gave us the example of Columbus, Ohio, where their storm water drainage problem showed more problems than their sanitaries or their combined, was that because there are so many illegal hook-ups?

Mr. **Ralph Petroff**. No. I think in a case of storm waters, its an urbanized area and they are getting a lot of——

Ms. **Molinari**. Metal.

Mr. **Ralph Petroff**. It's not organic load so much as the inorganic load. In fact, that brings up another very interesting area. So many cities that have combined sewers are now separating their sewer systems. The cities that have combined sewers, San Francisco is a perfect example, they are now happy they have combined sewers because they are treating all urban run-off and there are many cities that are concerned that if we separate our sewers now, will we have to turn around and combine them later so we can treat run-off from both.

Ms. **Molinari**. I think that's a very valid point. I thank you very much for raising some very interesting questions.

Mr. **Ralph Petroff**. Thank you.

Mr. **Nowak**. Congressman Pallone from New Jersey, he also is interested in this program.

Mr. **Pallone**. I have to apologize. I missed your testimony so I really can't ask any questions. As far as the CSO problem is concerned, I really think that in New Jersey and in the New York Bight in general that really is, in my opinion, the major problem that we must confront, not only as a committee but as a Congress. I am going to be reading what you presented us today. It seems very interesting.

Thank you, Mr. Chairman.

Mr. **Ralph Petroff**. Thank you, Mr. Congressman.

Again, let me emphasize, CSOs are just one part of the overall wet weather problem. We can end up spending $100 billion or $200 billion on CSO and then say, ought oh, now we've got to spend money on storm water and now we've got to spend money on raw sewer overflow as well. So if you folks can all collectively help EPA to understand that all CSOs are not created equal, and let's look at this problem as one big hole, and not look at it in a piecemeal fashion, I think it will save everybody a lot of time and a lot of effort.

Mr. **Nowak**. Just to follow up on your last comment, how do we get EPA to advise us scientifically that that should be the approach this committee should direct EPA to take?

Mr. **Ralph Petroff**. That's an interesting question.

Mr. **Nowak**. And how do we pull together the different avenues of entrance into the whole pollution stream you mention, from all the nonpoint sources including just surface run-off and all the other streams that are entering into the Buffalo river 20 miles away, where a farmer is putting tons of pesticides on that tomato that I eat during the summer?

Mr. **Ralph Petroff**. You have to make it water quality driven. What is the impact on water quality? If you measure it, you will see how bad of a problem it might be, but it's a complex issue and I think spending money on it in piecemeal fashion will just get us in deep trouble. My father's analogy that CSO control the way it presently is being pursued as being an environmental Maginot Line, is very true, because it will give us that false sense of protection and then we will be outflanked by other more serious pollution problems.

Mr. **Nowak**. Well, thank you very much for your thoughts and certainly your practical experience has shown to be successful and I look forward to working with you on some of these ideas as we pursue a total, better, Water Pollution Control Program.

Mr. **Ralph Petroff**. You've got a tough job.

Mr. **Nowak**. Thank you very much.

Mr. **Ralph Petroff**. Thank you Mr. Chairman.

[Mr. Ralph Petroff's prepared statement appears on page 664.]

[Whereupon, at 12:46 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

Statement of
Samuel P. Hunter
on Behalf of
The Associated General Contractors of America
Presented to the
House Public Works and Transportation Committee
Subcommittee on Water Resources
on the Topic of Reauthorization of
The Federal Water Pollution Control Act
April 4, 1990

AGC is:

- More than 32,500 firms including 8,000 of America's leading general contracting firms responsible for the employment of 3,500,000-plus employees;
- 102 chapters nationwide;
- More than 80% of America's contract construction of commercial buildings, highways, industrial and municipal-utilities facilities.

The Associated General Contractors of America
1957 E Street N.W., Washington, D.C. 20006-5199, (202) 393-2040, Fax (202) 347-4004

My name is Sam Hunter and I am a construction contractor from Goldsboro, North Carolina. With me is Brian Deery who is with the national staff of the Associated General Contractors of America. I am here today representing AGC and its 102 chapters nationwide. AGC represents more than 32,500 firms, including 8,000 of America's leading general contracting companies which are responsible for the employment of more than 3,500,000 individuals. These member contractors perform more than 80 percent of America's contract construction of commercial buildings, highways, heavy, industrial and municipal-utilities facilities.

AGC appreciates the opportunity to present is position on the important topic of reauthorization of the Federal Water Pollution Control Act. AGC calls on this subcommittee to increase the authorized funding levels for capitalization grants for the state revolving loan funds for the remaining three fiscal years to a level which will allow for the recouping of the funds which have been lost since 1987 due to appropriations below the authorized levels. AGC further calls on this subcommittee to authorize continued Federal capitalization grants beyond 1994.

When Congress passed the Water Quality Act of 1987, a very clear message was sent to the American public. The message was that clean water is an important factor in the quality of life and remains a primary goal that this country is committed to achieving and maintaining. In passing that legislation, tough choices were made. It was decided that the best way to continue progress towards the clean water goal is by transferring responsibility for the funding of this effort from the federal government to state and local governments. To ensure that previous accomplishments would not be undermined and that progress would continue, a rational, reasonable phaseout of the federal program was instituted. The phaseout called for a gradual reduction in federal grants and for the establishment of state revolving loan funds (SRFs) to finance the program into the future. Federal seed money was to be provided to help states establish their SRF programs. States were required to provide a 20 percent matching share. Minimum funding levels were established to ensure continuity and a smooth transition.

Unlike the existing construction grants program, the revolving loan funds will eventually be self-perpetuating. Local governments will be required to establish user charge systems to pay back the loans. The repayments will go back into the SRFs thus providing money for future clean water needs. AGC strongly supports this Congressional effort to continue progress toward improved water quality by compelling state and local governments to meet their obligation to pay the costs involved. This obligation of state and local governments is conditioned, however, on the federal government meeting its obligation to ensure that adequate capitalization funding is provided.

Unfortunately, this program has been subject to continuous underfunding since 1986. Over the past five fiscal years a total of $1.6 billion has been cut from the authorized levels contained in the Water Quality Act. The Administration's budget proposal for fiscal year 1991 requests only $1.6 billion, a thirty-three percent cut from the authorized funding level of $2.4 billion. AGC is concerned that clean water progress will be set back significantly if this underfunding is not recouped and if the transition period is not extended.

Thus far 44 states have established acceptable SRFs and have been awarded capitalization grants by EPA. The vast majority of these states received their first capitalization grants within the last year. Even if a state were ready to immediately award all of the funds it received from EPA as loans to local governments for wastewater treatment projects, it will be four or five years before repayments will begin to flow back into the SRFs. This is because loan recipients are not required to begin paying back the loans until one year after the project is put into operation.

Also, loans can be amortized over a twenty year period which will mean that the initial amounts flowing back into the SRFs will be small. Thus in 1995 when Federal capitalization grants are scheduled to cease, there is a real possibility that adequate funds will not be flowing into the SRFs to enable them to continue to make loans.

If this is allowed to happen there is a real concern that clean water progress will be undermined and there may actually be a decline in water quality. Wastewater treatment needs continue to grow. While most of the major wastewater systems are in compliance with water quality standards, a significant percentage of small systems are not in compliance. In addition, many of the systems that were built in the mid-1970s are beginning to approach the end of their useful lives and will need modernization, replacement and overhaul. Also, new water quality projects to control non-point source pollution and to correct combined sewer overflow problems will compete with the more traditional projects for the limited available funds.

Already there are signs that the nation is losing ground in its effort to continue progress towards clean water. EPA's 1988 Needs Survey, which estimates the capital costs to build publicly owned municipal wastewater treatment facilities to comply with the requirements of the Clean Water Act, documents $83.5 billion in facility needs. After accounting for inflation, this represents a nearly $3 billion increase in needs since the last Needs Survey was reported in 1986.

AGC fully supported the move to transfer the responsibility for funding the construction of wastewater treatment facilities from the Federal government to states and localities through a revolving loan fund mechanism. AGC remains fully committed to this transfer. However, AGC believes that some fine tuning is necessary to ensure that the SRFs are adequately funded to successfully carry on the program. AGC urges this subcommittee to increase the authorization for funding of capitalization grants for fiscal years 92 through 94 to a level that will allow for the program to be funded at the full $18 billion level anticipated in the Water Quality Act of 1987. AGC furthermore recommends that this subcommittee authorize the continuation of capitalization grants for several years beyond FY 1994 to ensure that there is not a sudden decline in loans available to localities to help them meet their wastewater treatment needs.

INTERMOUNTAIN WATER ALLIANCE

Testimony for the Subcommittee on Water Resources

On

Wednesday, April 4, 1990

By: Peter Maier, Dr.CE,P.E.
44 Lakeview
Stansbury Park, UT 84074

Representing: The Intermountain Water Alliance

TESTIMONY FOR THE SUBCOMMITTEE ON WATER RESOURCES

SUMMARY:

The Clean Water Act of 1972, as passed by Congress, is not being implemented by the EPA due to the fact that the federal regulatory program uses the BOD (Biochemical Oxygen Demand) pollution test incorrectly. The federal regulatory program ignores 35% of the water pollution, caused by fecal waste and 100% of the water pollution caused by urine waste. It ignores 65% of the water pollution caused by sewage.

The Congress promised the American public in 1972, that all water pollution would be eliminated by 1985. Now in 1990, eighteen years later, our open waters are still used as urinals for our cities. The Clean Water Act also authorized the EPA Administrator to achieve the goals of the Act by demanding "Best Available Technology." Best available technology in 1972 was 95% treatment, but the EPA Administrator currently only demands 35% treatment.

The incorrect use of the pollution test also made it impossible to enforce the federal program; treatment facilities could not meet their discharge permits, simply because the facilities were treating the sewage better than was required. In 1984 the EPA recognized this problem and modified the regulations by allowing a different test, the inhibited BOD test. This test simply does not measure the water pollution caused by urine waste. This test brought most of the facilities, earlier considered out of compliance, into compliance with their discharge permit. Prior to 1984, communities with facilities considered out of compliance with their NPDES discharge permit would be forced to modify or construct a new treatment facility, and were actually penalized for treating the sewage better than was required.

By changing the rule in 1984, the EPA at least would not penalize a sewage treatment facility for treating the sewage better than was required, but at the same time the EPA officially ignored 35% of the water pollution caused by fecal waste and 100% of the water pollution caused by urine waste. The lack of urine treatment has been disastrous for the federal program. Urine first is biochemically oxidized into nitrate and exerts an oxygen demand on the open water. Then, as a nitrate, it becomes a fertilizer for algae growth, which not only contributes to the eutrophication of lakes, but also creates all types of problems in wetlands, bays and oceans.

The incorrect testing also causes major problems with the designs of sewage treatment facilities. Facilities are basically designed for the wrong type of waste. Therefore, it is not surprising that so many problems are experienced with the operation of sewage treatment facilities.

To add insult to injury: If the EPA had demanded "Best Available Technology," as so clearly directed by Congress, most sewage in this nation would by now have received 95% to 98% treatment. This would have cost the public half of what it pays now for a meager 50% to 60% sewage treatment.

Utah State's Science Council evaluated the BOD issue in 1983 and recommended in 1984 that the BOD test should be properly applied. After a six month period the Council would evaluate the State's Water Pollution program with the new technical data. The Governor rejected the Council's recommendation, claiming that this would violate federal EPA policies.

As long as the EPA does not require correct testing, the water quality in our rivers, bays and oceans will only deteriorate further and the nation will continue to pay a very high price for treatment facilities that do not provide adequate sewage treatment. Achieving the interim goal of the Clean Water Act, swimmable and fishable waters, is possible. The only problem is that this is not in the interest of the specialized environmental-industrial complex, which presently has a monopoly on the knowledge needed to evaluate the projects it proposes and builds.

BIOCHEMICAL OXYGEN DEMAND (BOD) TEST:

The BOD test was developed in 1920 in England and enables scientists and engineers to predict if certain wastewaters are biodegradable and how much oxygen demand would be exerted if such wastewater would be discharged in open waters.

Figure 1 represents a BOD test curve for municipal wastewater. Actually there are two biochemical oxygen demands, one called the C-BOD, caused by heterotrophic organisms feeding on the carbonaceous compounds (fecal waste) and the second one called the N-BOD, caused by autotrophic organisms feeding on nitrogenous compounds (urine and proteins).

The reading of both BOD curves not only depends on the quality of feed compounds, but also on the presence and quantity of micro-organisms in the test bottle. Without the organisms, there would be no test reading at all. Autotrophic organisms are more complex than the heterotrophic organisms and take more time to grow and multiply.

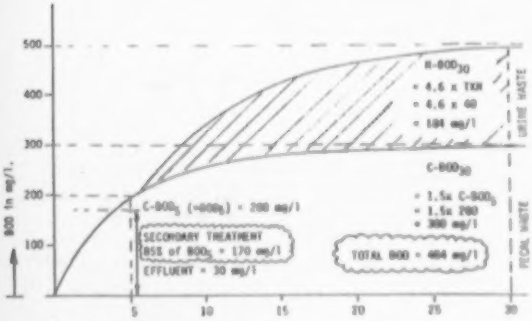


FIG 1 : BOD TEST CURVE FOR RAW SEWAGE.

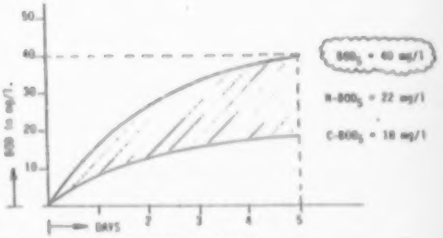


FIG 2 : BOD TEST CURVE FOR TREATED SEWAGE.

Since there was a distinct kink in the BOD test curve after 6 to 8 days, it was assumed that the activities of the autotrophic organisms only became significant after 6 to 8 days, and therefore the 5-day reading of the test only represented the C-BOD. Since the N-BOD could also be calculated with the result of the TKN (Total Kjeldahl Nitrogen) test, the 5-day BOD reading became a time saver. Instead of having to wait 30 days, one could calculate the BOD value of a wastewater with the 5-day BOD (BOD5) test value. If applied on sewage, as assumed in most literature, the 5-day BOD test value would be 200 mg/l and the TKN reading would be 40 mg/l. Using the time correlation factors developed for this test, one can calculate the C-BOD by multiplying the 5-day reading of the test (BOD5) with 1.5. The C-BOD of sewage is 300 mg/l. The N-BOD can be calculated by multiplying the TKN test value with 4.6, which will result in a N-BOD value of 184 mg/l. The total BOD value of sewage is 484 mg/l.

The Clean Water Act directed the EPA to initiate a federal program demanding "Best Available Technology" (BAT) or at least secondary treatment. Unfortunately there is no scientific definition for secondary treatment. However, it is generally assumed to be biological treatment or more specific 85% BOD treatment.

BOD in the meantime became the 5-day reading of the test and the differentiation between C-BOD and N-BOD was ignored or forgotten. When the EPA set pollution limits for their NPDES permit program, it used the 85% BOD treatment definition of secondary treatment and the BOD5 pollution limit was consequently set for less than 30 mg/l BOD5. Figure 1 shows the BOD test curve on sewage. By addressing only the 5-day value of the test curve, 35% of the C-BOD and 100% of the N-BOD is clearly ignored.

The EPA demanded the BOD5 test to be performed on the effluent of a sewage treatment facility, in order to prove that the facility was in compliance with its NPDES permit. Since the sewage has been subjected to the autotrophic organisms in the environment, the N-BOD was no longer delayed for 6 to 8 days and a large part of the BOD5 test consisted of N-BOD.

Figure 2 clearly shows that the BOD5 test reading of 40 mg/l in reality is 18 mg/l C-BOD5 and 22 mg/l N-BOD5. Until the rule change of 1984, a facility with this effluent would be considered out of compliance with its NPDES permit, while in fact the sewage had received a better treatment than was required for the permit. This plant was penalized for treating sewage too good.

Human discharge contains an abundance of heterotrophic and hardly any autotrophic organisms, since urine does not contain any bacteria. The autotrophic micro-organisms have to come from the environment, where they are in abundance. Most of the research on the BOD test was performed between 1920 and 1930 and probably with very fresh sewage. This more than likely caused the observed delay of the N-BOD in the testing. Due to their limited presence, the autotrophic organisms first had to multiply before their biochemical oxidation activity became significant.

The worldwide used assumption that the BOD5 test value of sewage only represents the C-BOD5 value is only valid for very fresh sewage, but it is errorous for sewage that has been exposed to the environment.

EPA's rule change of 1984 contributed the instantaneous carbonaceous and nitrogenous biochemical oxidation to the fact that the effluent has been exposed to autotrophic organisms in the treatment facility itself. Limited correct testing on raw sewage centering a facility, however, exhibited the same instantaneous N-BOD, and in some cases 60% of the BOD5 value in fact was nitrogenous. It stands to reason that the sewage was exposed to autotrophic organisms in the sewers. Proper testing will show that the sewage in some cities receives better treatment in the sewer than in the treatment plant.

Since the designs of sewage treatment facilities are based on the assumption that the BOD5 test is only carbonaceous, one has to come to the conclusion that these facilities are designed to treat the wrong type of waste. Nitrogenous waste demands a completely different type of treatment process than carbonaceous waste. Nobody, therefore, should be surprised that such plants fail to treat the sewage.

The sewage treatment facility for Salt Lake City was overloaded, according to the engineering study. The correct testing, however, showed that the plant only used 35% of its design capacity for C-BOD and did not provide any treatment for the N-BOD. The incoming sewage consisted of 40% N-BOD.

The following examples clearly show the problems caused by incorrect testing:

RAW SEWAGE: C-BOD5 = 200 mg/l
TKN = 40 mg/l
BOD = 1.5 x C-BOD5 + 4.6 x TKN = 484 mg/l

SECONDARY TREATMENT: BOD5 less than 30 mg/l.
No treatment requirement for N-BOD or TKN.

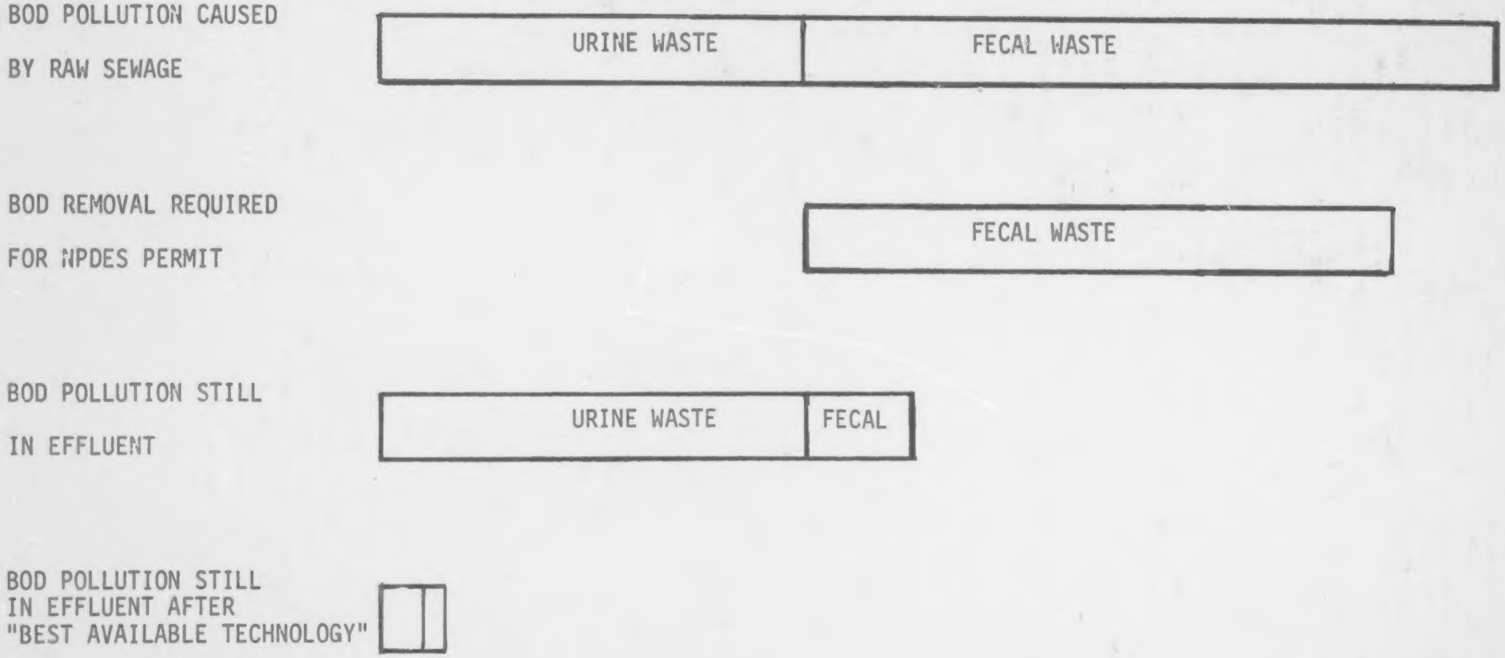
Plant A: Conventional Design
Effluent: BOD5 = 25 mg/l IN COMPLIANCE WITH NPDES PERMIT.
TKN = 40 mg/l
BOD = 1.5 x 25 + 4.6 x 40 = 221 mg/l (65% treatment)

Plant B: Old Fashioned Design
Effluent: BOD5 = 40 mg/l NOT IN COMPLIANCE WITH NPDES PERMIT.
C-BOD5 = 20 mg/l
TKN = 10 mg/l
BOD = 1.5 x 20 + 4.6 x 10 = 81 mg/l (83% treatment)

Plant C: Best Available Technology
Effluent: BOD5 = 10 mg/l EXCEEDING ITS NPDES PERMIT.
C-BOD5 = 5 mg/l
TKN = 4 mg/l
BOD = 1.5 x 5 + 4.6 x 4 = 25 mg/l (95% Treatment)

Plant C, according to EPA cost data, can be operated and built for half the cost one has to spend for Plants A or B. The superior treatment and the savings in cost does not appear significant for the EPA to demand this type of treatment in order to implement the Clean Water Act as clearly was intended.

BOD WATER POLLUTION CAUSED BY SEWAGE AND POSSIBLE TREATMENT.



Thanks to the Clean Water Act, this environmental-industrial complex has an open door to the federal treasury.

With his attack on the BOD-5 test and the design of sewage plants, Maier broadened his critique from Salt Lake City to the national clean-water program.

Washington, D.C., water-lawyer Larry Silverman says that people at EPA headquarters tell him off the record that Maier is right, and that regulations and tests can and should be improved. But they also tell him change is impossible because, Silverman says, "It would require the re-education of an entire industry." He adds that it might also require the re-tooling of an industry that is happy with the status quo.

Salt Lake City illustrates the industry's ability to resist change. According to Silverman, "In Salt Lake City, as in most of the country, there is a sewer lobby. They have a product to sell and they sold it. There are equipment manufacturers, engineers who design it, construction companies that build it. They're all good citizens in the sense that they support the local politicians; they are well placed and highly organized."

Thanks to the huge sums allocated to sewage plant construction under the Clean Water Act, this environmental-industrial complex has an open door to the federal treasury. It also has a monopoly on the knowledge needed to evaluate the projects it proposes and builds.

TESTIMONY

A REALISTIC APPROACH TO CSO CONTROL

Multi-Billion Dollar Savings Exist

Ralph G. Petroff

Committee on Public Works and Transportation
Subcommittee on Water Resources

April 4, 1990

ADS
Services Inc.

April 4, 1990

Honorable Henry J. Nowak
Chairman
Water Resources Committee
House Committee on Public Works and Transportation
Rayburn House Office Building
Room 217
Washington, D.C. 20515

Dear Congressman Nowak:

I would like to thank you and your staff for inviting me to appear again before this subcommittee.

This testimony contains some data which I believe will surprise the subcommittee. The information used in this testimony has been condensed from our experience in over 3000 U.S. cities.

I trust that you will find this of practical value in your consideration of our country's water pollution control strategy.

Sincerely,

ADS SERVICES, INC.

Ralph G Petroff

Ralph G. Petroff
President

2227 Drake Avenue, Building 26 / Huntsville, Alabama 35805 / (205) 883-9323 / Telex 4933400

TESTIMONY

A REALISTIC APPROACH TO CSO CONTROL

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April 4, 1990

TESTIMONY OF RALPH G. PETROFF

A REALISTIC APPROACH TO CSO CONTROL

Multi-Billion Dollar Savings Exist

INTRODUCTION

My name is Ralph G. Petroff and I am President of ADS Environmental Services, Inc. in Huntsville, Alabama. Our company has performed work for over 3,000 municipal sewer agencies in the United States and Canada. We collect computerized sewer flow data from many dozens of points from within a sewer to determine how the sewer system operates. In a sense, our company serves the function of "a sewer auditor" for municipal sewer agencies. We have monitored tens of thousands of sewer manholes, separate sewers, combined sewers and combined sewer overflows.

We have compiled a database covering over 3,000 cities reporting on how their sewer systems actually perform under a variety of dry and wet weather conditions. Because of the nature of our work, we have a unique perspective on how sewer systems actually operate. This unique perspective has allowed us to draw certain conclusions. This perspective and these conclusions may be valuable to this committee as it evaluates the future of municipal wastewater programs in general, and combined sewer overflow in particular.

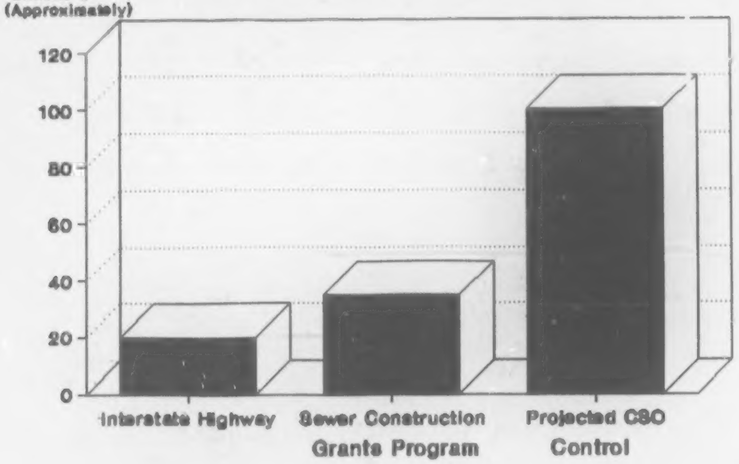
SUMMARY

In today's testimony, I would like to present three subjects:

- The likely costs and potential benefits of present Combined Sewer Overflow (CSO) control.
- A recommended approach that can dramatically reduce the cost of CSO control.
- Alert the Committee to a potentially more serious water quality problem that has received little attention.

Let me summarize each of these points briefly.

First, the present approach to CSO control will probably cost the 1200 cities with CSOs at least $100 billion. If all CSOs are eliminated, this cost will likely increase to over $200 to 300 billion. The costs of CSO control under the present approach are enormously expensive. In discussions with our municipal clients who have CSOs, many of them report that their projected CSO control costs will be far and away the most expensive public works program their city has ever undertaken. The cost for CSO control will be far greater than the cities' combined costs for their airport, wastewater treatment works and interstate highway system. The potential benefits of such multi-billion dollar sums are questionable. While there are CSOs that represent a serious water quality problem that demands aggressive and immediate action, there are many CSOs that generate a negligible or immeasurable water quality problem.



Local Financial Share of Public Works Programs

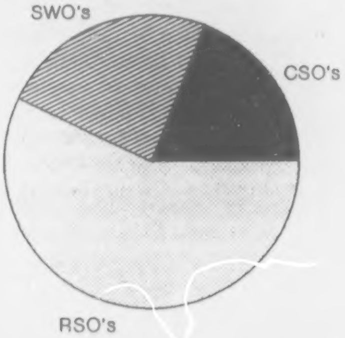
The present direction of the CSO program has the potential to yield the most expensive public works program in the history of American cities, while potentially achieving only a marginal water quality benefit. Some CSO control programs are already being likened to the environmental equivalent of a Stealth bomber or even an environmental Maginot line.

Second, fortunately, these potentially enormous costs can be significantly reduced if a change in the strategy in the CSO program is undertaken. We must recognize that all CSOs are not created equal. Some have significant water quality impact. Many do not. **Only** those that have significant water quality impact should be eliminated. The rest should be left as is. Through detailed study of actual, specific CSO behavior and actual water quality impact, a significant reduction in CSO costs can be obtained.

Such cost savings have been obtained by a number of cities in the U.S. Their findings will be presented.

Third, it is important to put the CSO problem in perspective. The CSO is a smaller piece of a larger overall problem. That overall problem is the Wet Weather Point-Source problem. This consists of three different point sources:

- Combined sewer overflow (CSOs)
- Storm water overflow (SWOs)
- Raw sewer overflows (RSOs)

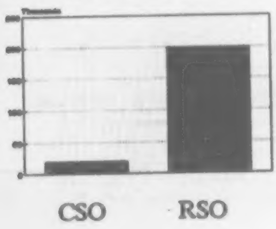


The Wet Weather Problem
(Point Sources)

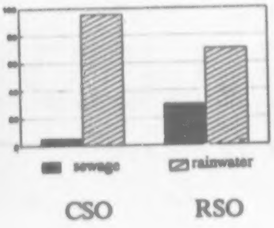
Storm water overflows are discharges from separate storm systems that enter the receiving waters. There has been recent action taken by EPA to determine the water quality impacts of the storm sewers. Preliminary indications reveal that the water quality impacts of storm sewers can be significant.

RSOs, or raw sewer overflows, occur in separate sewer systems. The key differences between raw sewer overflows and CSOs, is that CSOs are combined storm and sewer overflows, while RSOs are sewer overflows in separate sanitary sewer systems. When separate sewers become overloaded during rain events, they result in raw sewage overflows. Sewage gushes forth from the tops of manholes and out of bypasses at treatment plants, sewer lift stations and "after-the-fact" bypasses constructed into manholes.

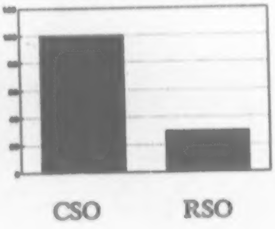
It has been estimated that there are about 20,000 CSOs in the U.S. A realistic estimate of RSOs is 200,000. While a CSO discharge into receiving waters might be 5% sewage and 95% stormwater, the discharge from RSOs is typically 30% or more sewage with the rest rainwater. RSOs are more numerous than CSOs. RSOs have a greater concentration of sewage than CSOs. RSOs are therefore potentially a more serious problem than CSOs. Fortunately, the costs to eliminate RSOs is far more cost-effective than CSO control.



Estimated Number



Water Quality

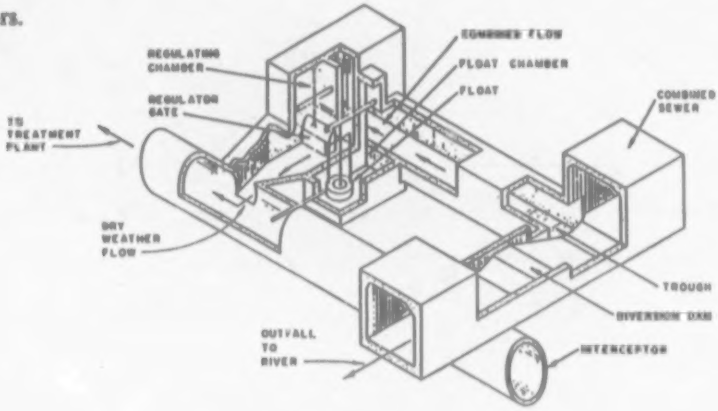


Cost of Correction

BACKGROUND

Combined Sewer Systems

Most combined sewer overflows were constructed before World War II. Combined sewer pipes normally run 5-10% of their capacity with sewage. The systems are designed to accommodate storm water. During rain events, great quantities of rain water enter the combined sewer system. When the capacity of the system is reached, some diluted sewer flow exits through structures called Combined Sewer Overflow regulators.


COMBINED FLOW
REGULATING CHAMBER
FLOAT CHAMBER
FLOAT
REGULATOR GATE
COMBINED SEWER
TO TREATMENT PLANT
DRY WEATHER FLOW
TROUGH
DIVERSION DAM
OUTFALL TO RIVER
INTERCEPTOR

TYPICAL FLOAT CONTROLLED REGULATOR

The purpose of the combined sewer overflow regulators is to contain the heavy pollutant load of the "first flush" scouring action of the rainstorm. Flow is retained behind dams and other structures and it is hoped that the majority of this "first flush" will be retained and transported to the sewage treatment plant. Overflows that do occur should have a minimum water quality impact. Presently, EPA is formulating a strategy to deal with the water quality problems that result from combined sewer overflows, however, each state is required to write its own plan. Congress needs to get involved.

Costs of CSO Control

The cost of combined sewer overflow correction is very significant. Conventional CSO control techniques rely upon extensive construction of massive piping and storage networks. Most of these piping networks are in heavily urbanized areas along shore lines and river fronts. Significant costs occur with the construction of subway tunnel sized piping networks, hundreds of feet under the surface of the ground.

Approximately 1200 sewer systems in the United States have combined sewers. The average sewer system has approximately 20 combined sewer overflows for a total of over 20,000 combined sewer overflows nationwide. There are several rules of thumb that have been developed for CSO control costs.

- Cost of CSO correction is $10 to 50 million per square mile of combined sewered area.
- $1 to $5 million per CSO structure
- $1000 to $5000 per capita

Medium-sized cities like New Bedford, MA, and Richmond, VA, have budgets of a quarter billion dollars for projected CSO correction costs. These are not the exception, they are the rule. Even smaller cities like Columbus, GA, and Saginaw, MI, have projected $60 to $80 million costs.

There is a growing misconception that all CSOs are "bad" and must be stopped. Some State regulatory agencies have called for elimination of all combined sewer overflows within a few years. This is driving the cost of the CSO solution ever higher. This approach can easily cause the cost of CSO control to increase from $100 billion to $200 billion or more. Again, the projected costs are just that - projected. As with many long term projected expenditures, the final cost might be far higher.

The Water Quality Impact of CSOs

How severe a water quality problem is combined sewer overflow? This is difficult to accurately determine. It is time consuming and expensive to study the behavior of CSO overflow and its water quality impact. Yet from our experience, and the experience of others in monitoring and studying how CSOs **actually** behave, I think several conclusions can be drawn. They all relate to the basic point that all CSOs are not created equal:

- Some CSOs will discharge with almost every rain.
- Some of those discharges will consistently have a significant water quality impact, some will not.

- Many CSOs discharge only infrequently.
- Many CSOs discharge once a year or less.
- The water quality impact of many CSOs is marginal or scarcely measurable.
- Routine maintenance of CSOs can reduce or even eliminate many CSO discharges and other problems.

It is the polluted CSOs that we must stop, not the relatively harmless ones. Certainly, there are many CSOs that present a water quality problem and should be aggressively addressed. Such CSOs are cost-effective to repair and should be.
However, many of the CSOs in the country perform as they were designed to perform. Civil and environmental engineers of a century and more ago succeeded in their goal to minimize the impact of much of the CSO discharge. Through careful engineering, many of the CSOs, using elaborate systems of gates, diversions, sluices and dams contain "the first flush" of heavy pollutants. In many cases, when the overflow occurs, very dilute sewage is overflowed while the heavy pollutant loads are stored and transported back to the sewerage treatment facilities.

We owe these civil engineers of long ago a tremendous debt. Without benefit of computers or even calculators, they designed thousands of CSO regulators that perform today as they were intended. Thus, the notion that all, or even most CSOs are bad, is not supported by the facts.

To assume that all or most CSOs are bad is dangerous. It will lead to spectacularly expensive and unnecessary CSO control projects. If all CSOs are fixed, much of the $100 or $200 billion spent will have marginal water quality impact.

Practically speaking, there is no way the 1200 older cities that have CSOs can shoulder a cost greater than the combined local share of the entire interstate highway, airport and sewage construction grants program. Worse still, if that money is spent, the water quality impact will be little different from spending only a fraction of that amount.

In addition to virtually bankrupting these cities, anti-water pollution backlash would surely develop. People will ask, "why spend hundreds of billions for water pollution control projects of marginal benefit." This can undermine the important public support for environmental projects that exists in this country. That is why, if the strategies are not redirected, CSO control programs may well become the environmental equivalent of the Stealth bomber or of the Maginot Line. Like those ill conceived defense systems, it would provide a false sense of protection, while other more serious problems outflank us.

RECOMMENDATIONS FOR A NEW CSO CONTROL STRATEGY

CSO control strategy must be water quality driven. If there is a serious water quality problem from a CSO, fix it. If there is not a quality problem, don't fix it. Don't spend tens of billions of dollars on marginal problems.

The only way to determine the water quality impact of CSOs is to go out and measure the **actual** water quality impact. Too much of the water quality information that has been collected is not actual data. It is instead "assumed", "theoretical", "derived", "presumed", "simulated", "modeled", "estimated", or "projected". Cities' must determine how they **actually** operate. They must determine how frequently these CSOs overflow, for how long they overflow and how much water quality impact there is on the receiving waters. It may be necessary to monitor the behavior of these overflows for a year or perhaps two in order to really figure out what is occurring.

There is an impatience on the part of many agencies and regulatory officials to "study" a problem, instead of just going out and fixing it. In the case of combined sewer overflows however, I think the studying is not only justified, it is indispensable. The dollars to be spent on this program are too large to be based on "assumptions" and theoretical models of how the combined sewers behave. It is essential to study their actual behavior.

One deterrent to performing such studies is their cost. It can cost $10,000 to $50,000 per CSO to determine its actual water quality impact. This is expensive, but it obviously is less than $1 to $5 million per CSO construction cost. But spending 1% of the proposed construction costs on actual water quality impact is ultimately a bargain. For those cities who have conducted such studies, the benefits are significant. Let me give you just two examples.

Within the last 18 months, the City of Chattanooga has been developing a CSO control strategy. Eighteen months ago, they estimated that they would need to spend in excess of $80 million to correct their CSO problems. They conducted an extensive monitoring program to determine the actual behavior of their CSOs. By determining the actual discharges and water quality impact, they were able within a year's time, to reduce their CSO control estimates down to $40 million. In addition, they received a significant benefit of understanding how their CSOs operated. By performing regular maintenance on many of these sites, CSO discharges are being reduced and additional in-line capacity has been reclaimed.

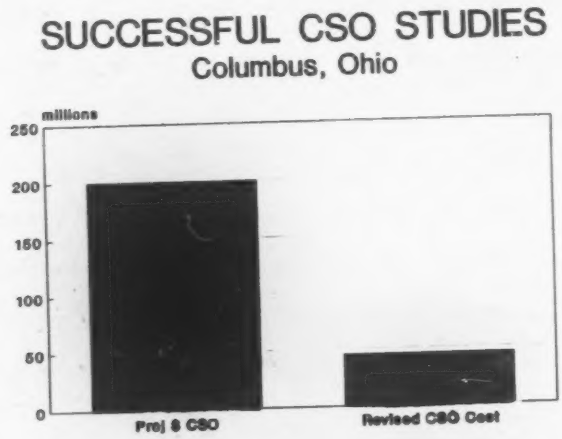
The City of Columbus, Ohio provides perhaps a more dramatic example. They have one of the largest wastewater treatment plants in the country emptying into one of the smallest rivers. In dry weather, the flows from the Southerly and Jackson Pike Wastewater Treatment Plants can be ten times larger than the flows in the Olentangy River. Because of this, the treatment plants are not secondary plants, but rather more expensive, advanced wastewater treatment plants. In 1986, the City of Columbus and its consultant developed a CSO control plan. The costs for CSO control were projected to be between $150-250 million.

It was thought that the CSOs would have a significant impact on water quality of the Olentangy due to the river's small flow, and the large number of CSOs that discharged into the Olentangy. All of the combined sewer overflows were measured for:

- duration and frequency of overflow,
- water quality of the overflow,
- and water quality of the receiving waters.

After analyzing the effect of many discharges into the Olentangy, especially during the July, August and September dry weather flow months, it was determined that only two of the 34 CSOs had a significant impact on water quality. Most of the CSOs showed no real change in water quality. In fact, a water quality problem appeared to be developing from separate storm water discharges outside of the combined sewer areas.

Based on this information, the City of Columbus was able to significantly scale back the potential CSO control project cost. Costs of $150 to 250 million were reduced to $45 million.



The Columbus project is especially significant because of the large number of CSOs discharging into sensitive receiving waters. The fact that so few CSOs had water quality impact in this worst case scenario suggests that other cities' CSO discharge into larger rivers may also have little water quality impact.

In order to help achieve effectiveness and reduce the cost of the CSO control program, the following recommendations are being made:

- Before any CSO control design and construction is initiated, a detailed Water Quality Impact Study of the receiving waters should be performed.
- The Water Quality Impact Study would determine the severity of the CSO discharge on the receiving water.
- The Water Quality Impact study should determine the **actual** impact of the CSO discharge, not just the **theoretical** impact.
- Every significant CSO should be monitored.
- CSO structures should receive regular maintenance to improve operation.
- Innovative CSO control technology should be utilized to the maximum possible extent.

I believe if such a program were instituted nationwide, it could reduce 80% of the CSOs price tag. There are many forms of innovative CSO control technology that have been proven effective throughout Western Europe and other countries with worse CSO problems than the United States. This CSO control technology is new to

America. All these technologies should be evaluated and extensive pilot programs performed to determine their effectiveness. I believe it is entirely possible that $20 billion spent creatively may have the same impact as $100 billion spent conventionally.

I first testified before this Committee nine years ago. There has been much progress in the municipal construction grants program in those nine years. Now, over 90% of the U.S. publicly owned treatment plants are in compliance. The program is considered by many to be a success.

Now let's go back a moment to nine years ago and recall what people were saying then about the Construction Grants Program.

There were many responsible people saying that the Construction Grants Program was a colossal waste of money. The Washington Post had a series of articles entitled, "Wastewater Monuments Lie Rusting in the Mud". What happened in 1981? Congress, EPA, the sewer authorities and wastewater professionals worked together and made sure the program remained on track. Many mid-course corrections were taken. The financial burden of these programs was shifted to the sewer agencies. These sewer agencies performed many heroic financial and technical cartwheels to reduce the overall construction cost and make the plants very effective.

I think 1981 was a watershed year. I think 1990 is another watershed year. The CSO issue has captured many headlines and much publicity. It is a watershed issue.

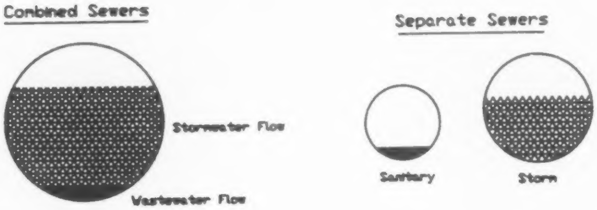
I think that the way EPA and the Congress handle this CSO issue going forward, will set the tone for water pollution prevention in the 1990's. We have an excellent opportunity to make a mid-course correction in what is now the most expensive part of the entire municipal wastewater construction grants program. It is important that these sensible steps be taken to assure that CSO control does not become a waste of time, money and above all the confidence of the American people.

THE RAW SEWER OVERFLOW PROBLEM

Background

Raw sewer overflows occur in separate sanitary sewer systems designed to carry only sewage. Although these systems are designed to carry sewage, extraneous water in the form of inflow and infiltration (I/I) overloads these systems and causes raw sewer overflows (RSOs).

TWO KINDS OF SEWER SYSTEMS


Combined Sewers
Stormwater Flow
Wastewater Flow
Separate Sewers
Sanitary
Storm

Inflow is rainwater that inadvertently enters the sewer system through manhole lids, cross-connections with storm drains, roof leaders and illegal storm drain connections.

Infiltration is groundwater that enters the sewer lines through cracks in the pipes and manhole structures.

Inflow and infiltration is a very significant problem. It is estimated that nationwide, 40 to 50% of all flows treated at plants is infiltration. During inflow, peaking factors of 300 to 400% are common for a typical city. Very high variations in the amount of I/I are common. Many cities in the country have infiltration as more than half their flow on an annual basis and have 5:1 or 10:1 inflow peaking factors.

This extraneous infiltration and inflow overloads the separate sewer systems that were never designed to carry these amounts of flow.

When a system runs out of capacity, the result is frequently a raw sewer overflow (RSO) from the separate system. There are primarily four types of raw sewer overflows.

- Overflowing manholes
- Bypasses from overloaded sewer manholes directly into the receiving waters
- Pump station bypasses directly into the receiving waters
- Treatment plant bypasses

It is estimated that there are 20,000 combined sewer overflows in the country. There is no reliable count on the total number of raw sewer overflows because most cities are unaware of the exact number. Unlike combined sewer overflows, RSOs are usually installed in the system after the fact. In many cases, no maps or records exist to record their location. Many of these bypasses were born when maintenance crews in past decades knocked holes in the sides of the manholes to relieve local flooding. None-the-less, any realistic estimate of the number of RSOs generates a huge number. Almost every city in the U.S. has sewer bypasses, and many have dozens or hundreds. It is not unrealistic to assume that the average system served by a treatment plant has at least 10 overflows. Multiplied by 20,000 treatment plants, this would generate a number of 200,000 raw sewer overflows.

Raw sewer overflows create the following problems. Sewage is discharged into:

- creeks
- ditches
- lakes
- rivers
- lawns
- beaches
- oceans
- and especially into homeowner's basements

In addition to the 200,000 RSOs, infrastructure experts estimate that 800,000 basement floodings occur annually. In addition to the nuisance aspect, these 800,000 annual basements floodings result in enormous property damage and public health concerns.

Since the RSOs have a greater proportion of sewage than the CSOs, and since there are far many more RSOs than CSOs, it is likely that the RSO problem is far more significant than the CSO. Therefore, close, careful attention should be given to the elimination of RSOs.

Fortunately, correction of RSOs is far more cost-effective than the correction of CSOs. Costs to remove infiltration and inflow from sewer systems has been steadily declining over the years as the effectiveness of I/I removal techniques increases.

The case study of the City of Indianapolis represents an excellent example. In 1986, continued development on the northern side of Indianapolis was creating hydraulic capacity problems further to the south. During a typical rainstorm, three to four thousand basement floodings were occurring in northern Indianapolis. There were numerous RSOs. A sewer moratorium in the fast growing area was declared. The Indianapolis Department of Public Works analyzed the various options. Sewer relief lines would take many years and millions of dollars to construct before relieving the problem. The City decided to initiate an I/I control program.

The I/I control program took one year including the detection of the leaks and the actual rehabilitation. Total cost in that year was only $3.3 million. Total flows were reduced from 22 million gallons of I/I down to 14 million gallons. More significantly, the chronic basement flooding was virtually eliminated. In the first two years after the rehabilitation, no major sewer basement flooding occurred. In large storms three years later, sewer basement flooding occurred at only 20% of the previous locations. Other innovative agencies like the City of Houston, Nashville, and the Washington Suburban Sanitary Commission have been achieving similar results.

The RSO problem is a severe one that has not received significant attention. Many people are not aware of its existence. The 1990's and beyond will continue to apply major pressure on public works infrastructure in America. The need for public infrastructure improvements has been growing steadily. The demand is enormous, not just for sewers, but for water systems, highways, public transportation systems and other utilities.

The federal grants historically available for this type of work are no longer readily available. Therefore, an enormous financial and technical burden has been placed on the cities, many of whose tax bases are steadily eroding. Given this situation, it is imperative that the United States and this Committee continue to search out all opportunities to try and achieve the biggest "bang for the buck" in all public works programs.

Ultimately, the **quality** of the receiving waters should dictate the action required.

The testimony here today has tried to focus on not just the CSO and RSO problem, but the whole issue of effective public works management. If we use innovative techniques, approaches and technologies in the wastewater field, there will be more money to spend on highways, bridges and water systems. We should continue to carefully research lower cost alternatives for other public works so that we may have more money available for the remaining programs as well. The demand for public works improvements in this country will only become greater as we go forward.

The great public works of the 19th and 20th century in the United States are a tribute to the foresight of those early engineers and government leaders who built the greatest infrastructure system the world has ever known. This infrastructure is, in so many ways, the cornerstone of our economic strength. In order to protect and preserve that economic strength, we must all provide new ideas and new approaches so that we may continue to build upon this base into the rest of the decade, into the next century, and beyond.

APPENDIX

- Newspaper Stories on Raw Sewer Overflows
  Week of February 18 - 24, 1990

- Underground Intelligence - CSO

- Murfreesboro, Tennessee Before and After I/I Removal

Nationwide - February 18-24, 1990

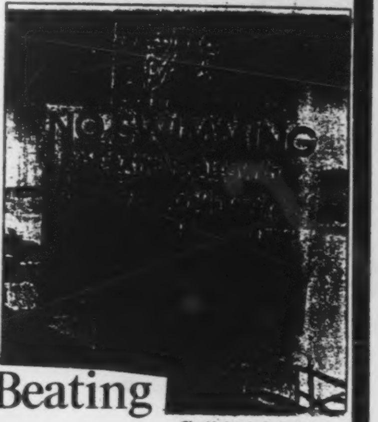
Third sewage spill in 2 weeks runs into Monterey Bay

By Kevin Howe
Herald Staff Writer

Sewer repairs may force building ban

City pipes need 'good cleaning'

By TOM ELIA
Staff Writer



(Herald photo by Orville Myers)
SIGN WARNS SWIMMERS

1373

Our Beaches Are Taking a Beating

1373

Fairfield outlines plans to resolve sewer backups

BY IRENE WRIGHT
The Cincinnati Enquirer

Sewage Spill Keeps 18 Miles of Coast Closed

■ **Environment:** L.A. officials dump 8 million gallons into Santa Monica Bay when storm-swollen sewers threaten to overflow into city streets.

Sewer Imperils Stream

By SCOTT YATES

1373

Lovers Point beach closed by sewer leak

By Thom Akeman
Herald Staff Writer

East Union Twp. couple fear sewage system will foul water

By KENT JACKSON
Standard-Speaker Staff Writer

Nationwide - February 18-24, 1990

1373

Rain forces Dublin plant to leak sewage into Scioto

By Mary Stephens

1373

Sewer plant near capacity

Council studying water infiltration problems

By BILL I
For The D
WOMELSDORF

1373

Town Hoping for Prison Working To Keep Waste Water Out of River

By Denise A. Raymo
Times Staff Writer

1373

Pumps working to avert flooding

MISHAWAKA — Sewer Depart-

Bubbling up

'It's the pits'

Sewage spills into park lots

By CARA CHANG MUTERT
BDR Staff Writer

Complaints of raw sewage on

Beaches Reopen, but Sewage Runoff Causes Concern

By PAUL FELDMAN
TIMES STAFF WRITER

Old problem strikes anew: Sewage flows into Sound

By LOUISE TAYLOR
STAFF WRITER

Rain swamps Lincoln sewers

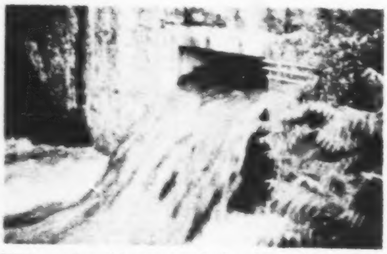
By Bill Dolan
Staff writer

UNDERGROUND INTELLIGENCE

An ADS Services, Inc. Publication **Vol. 4, No. 1** **CSO Edition**

Cities and States Combat CSO Problem

Columbus Saves $100 Million Through Innovation



Cities nationwide are combating the environmental and economic effects of CSOs.

Newspaper stories of polluted beaches and contaminated waterways have focused attention on one of today's hottest environmental issues - Combined Sewer Overflows (CSOs).

EPA reports indicate that there are approximately 1200 cities nationwide with combined sewer systems. All are now faced with the complex problem of trying to minimize or even completely eliminate the impact that CSOs have on the environment.

One of the most sobering statistics regarding CSOs is the amount of money believed to be necessary to correct this problem. Estimates easily run into the $50 to $100 billion dollar range. Even medium-sized cities like Richmond, Virginia, and New Bedford, Massachusetts, face near quarter billion dollar price tags.

The City of Columbus, Ohio, was well aware of the potential costs involved in CSO abatement and control. In fact, it had been determined that a CSO control program would cost the City at least $145 million, a staggering sum to any city facing increased pressure to deal with environmental problems and decreased federal funding.

The City's ultimate goal was to do whatever was necessary to minimize the CSO water quality impact on the receiving bodies of water; the Scioto River, the Olentangy River, and Alum Creek. A major emphasis of their program was a year-long flow monitoring study to provide actual flow data upon which to base the projected financial expenditures.

The first step in the City of Columbus's fact-finding mission was the installation of 130 sewer flow meters, 20 rain gauges, and 5 river gauges. These monitors served the particular purpose of determining the actual effects of CSO discharge on the receiving waters. Every CSO was monitored for the frequency and duration of each discharge event.

Water quality sampling, a process automatically triggered by the flow monitors, was also conducted at each of the flow monitoring locations and river gauges. Sewer flow data, rainfall amounts, and water quality data were then synthesized into pollutographs. This actual field data also permitted a thorough and effective calibration of

(continued on page 2)

In This Issue . . .

The City of Columbus saves $100,000,000 with CSO monitoring program (pg.1)

The CSO Partnership (pg. 2)

Guest author George Kurz highlights Chattanooga's CSO program (pg. 3)

Commentary - All CSOs are not created equal (pg. 4)

and . . .

Ear to the Underground

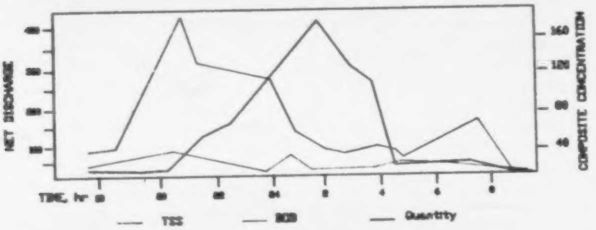
(continued from page 1)

the City's sewer model, eliminating much of the inherent assumptions normally associated with modelling.

The end results of the CSO monitoring program were dramatic. Only 2 of the City's 34 overflow points had a significant impact on the receiving waters. Therefore, construction to control the overflows at all discharge points was deemed unnecessary. Only the critical overflow points would merit control measures.

The City's projected costs for CSO control will be reduced by approximately $100 million due to reduced construction costs - with the same environmental benefits as the original, more expensive, program.

Dennis Long, P.E., currently of Malcolm Pirnie, was with URS Corporation, the City's consulting engineering firm, at the time of the study, and was responsible for this innovative project. He says that "the key to success of the program was a sewer model that relied extensively on actual field data. The ability to measure the actual field conditions and eliminate the guesswork was the key to reducing proposed CSO costs."



The "first flush" of a CSO discharge, shown above, contains the highest concentrations of suspended solids. Analyzing actual discharge frequency, duration, and pollutant loading can significantly reduce proposed CSO costs.

The CSO Partnership Grows in Size and Influence

COMBINED SEWER OVERFLOW
THE PARTNERSHIP

The CSO Partnership is rapidly increasing its presence in the waste water field. Cities, towns, municipal agencies, consulting engineers and regulatory officials nationwide are taking note as the organization makes its mark.

The Partnership's mission is to help local governments, utilities and agencies address their CSO problems within the means of their financial capabilities. To accomplish this, The Partnership seeks to educate local, state and federal officials on the nature and magnitude of CSO problems, their staggering costs, and the financial impact to individual citizens. The group expects to work actively for the adoption of CSO legislation that both protects the environment and shares the cost of CSO control among local, state and federal sources.

The CSO Partnership also seeks from EPA an affordable and rational approach to wet weather standards, monitoring requirements, and control techniques.

The City of Richmond, Virginia, spearheaded the concept for a nationwide CSO coalition, and its Mayor, Geline B. Williams, is chairman. Interest has grown in the last year from 20 cities to over 170. The need for this coalition to push for affordable regulatory policies and grant funding for CSOs is obvious. Cities such as Richmond, New Bedford, MA, San Francisco and Chicago will pay between $1300 and $2500 per capita in projected CSO control costs.

For more information on The CSO Partnership, call (804) 780-4812.

Guest Author

Mr. George Kurz, P.E.
City of Chattanooga

Mr. Kurz has been the System Engineer for the City of Chattanooga for 12 years. He is also a licensed treatment plant operator. Mr. Kurz is a graduate of Tennessee Technological University with a B.S. in Civil Engineering.

In the next decade many cities will confront the problem of bringing their combined sewer system into compliance with EPA's National Combined Sewer Overflow Control Strategy. That strategy, issued in August, 1989, set forth three objectives:

- To ensure that if CSO discharges occur, they are a result of wet weather,
- To bring all wet weather CSO discharge points into compliance with technology based requirements of the CWA and applicable State water quality standards, and,
- To minimize water quality, aquatic biota, and human health impacts from wet weather overflows.

A key element in the implementation of this strategy is good quality monitoring. EPA discusses the requirements for compliance monitoring for CSO discharges. While this is important to verify permit compliance and to document the impact on receiving waters, the methods used for this level of monitoring are not sufficient to collect the kind of information needed for managers and engineers to really understand how a given combined sewer system operates. Since there are a wide range of alternatives for solutions to CSO problems, some prohibitively expensive, the characteristics of the system must be defined with confidence so that appropriate values can be assigned to the design criteria for a given facility. Many facility plans for cities with complex systems incorporate computer modeling. However, as pointed out in WPCF's Manual of Practice FD-17, actual flow monitoring is necessary to provide the calibration and verification data for models.

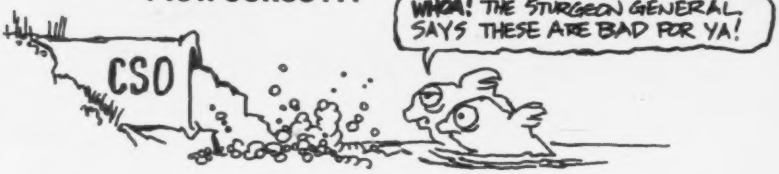
As a result of a State Commissioner's Order, the City of Chattanooga conducted a study of its CSOs in 1989 which included monitoring six CSOs and regulators selected to represent a cross section of different flows and qualitative loads to the receiving stream. This information was used by Camp Dresser & McKee, the City's consultant, to verify the SWMM (EPA Stormwater Management Model) used to model all 18 of the City's CSOs.

The lack of detailed information about CSO operations in a given city merely reflects the overall lack of operating information about collection systems in general. In light of the fact that problems in the collection lines usually have the potential for causing immediate customer complaints and/or may result in illegal discharges and violations, it seems reasonable to argue that most systems need more attention devoted to flow monitoring as part of the system management.

Other benefits gained from the Chattanooga study were: the discovery of dry weather overflows due to "frozen" gates; locating major sources of inflow and intrusion; identification of an interceptor that had occasional reverse flows; and mass balance calculations that pointed to unexplained inflow. All of these factors would have had a significant, inflationary effect on the final Facility Plan recommended for the City. The final plan is now estimated to cost about $40 million; less than half any previous estimate.

In summary, the importance of good flow monitoring for CSO correction planning may be seen as an analogy of the maxim expressed by the physicist Sir Ernest Rutherford that information is not science until it is organized and quantified!

Flow Jokes . . .


CSO
WHOA! THE STURGEON GENERAL SAYS THESE ARE BAD FOR YA!

Commentary

Peter D. Petroff, P.E.
Chairman Emeritus

All CSOs Are Not Created Equal

These days, you can't pick up an industry magazine without reading about the impact of CSOs. It seems that we have rediscovered the fact that CSOs are a problem. Well, let's correct that. CSOs are a potential problem.

After monitoring hundreds of CSO discharge points for frequency, duration intensity, and water quality impact, several trends have emerged:

- *Some CSOs have a major water quality impact with almost every discharge,*
- *Many CSOs have little or marginal water quality impact,*
- *Many CSOs will not even discharge with less than a 1 year storm.*

The notion that all CSOs are bad and should be plugged up is not backed up by the facts. All CSOs are not created equal. Instead of spending hundreds of billions of dollars correcting all CSOs, we should spend only what is necessary to correct just the bad CSOs.

How can you tell which are good and which are bad? There's only one way and that is to get the facts. Quantity and quality monitoring is most cost effective, especially with the alternative being hundreds of millions of dollars worth of new facilities. Modelling is a good tool, but monitoring only a few points and then "extrapolating" all too often ends in a "force-fit" model with a big construction price-tag. A calibrated sewer model is fine - but a flow-verified model is even better.

Columbus spent $1.8 million to monitor all 34 of their overflows. Their estimated construction costs went down from $145 million to $45 million. The City of Chattanooga cut their planned expenditures in half after incorporating the actual flow results into their planning and modelling assumptions.

You can't manage what you don't measure.

CSO Specialty Conference

The Water Pollution Control Federation will sponsor a Specialty Conference on Control of Combined Sewer Overflows. The timely conference takes place in Boston on April 8-11, 1990.

Speaker Highlights:

- ADS's Peter Keefe & Steve Phillips present "CSO Monitoring Yields High Impact Results" at 3:00 p.m. on April 9th.
- Guest Author George Kurz presents "Innovative Techniques for Flow Monitoring in Combined Sewer Overflows" at 2:30 on April 9th.

About ADS . . .

ADS Services, Inc. has provided Underground Intelligence® to municipal agencies and consulting engineers for more than 15 years in the fields of sewer flow monitoring and infiltration/inflow reduction. Our staff of over 200 professionals perform R&D, equipment engineering and design, complete installation and hydraulic profiling, flow monitoring, and data analysis. ADS equipment, software, and services are used worldwide in permanent and temporary installations for • billing • I/I analysis and reduction • CSO, stormwater, and rainfall monitoring • sewer sizing and modelling • and SSES studies.

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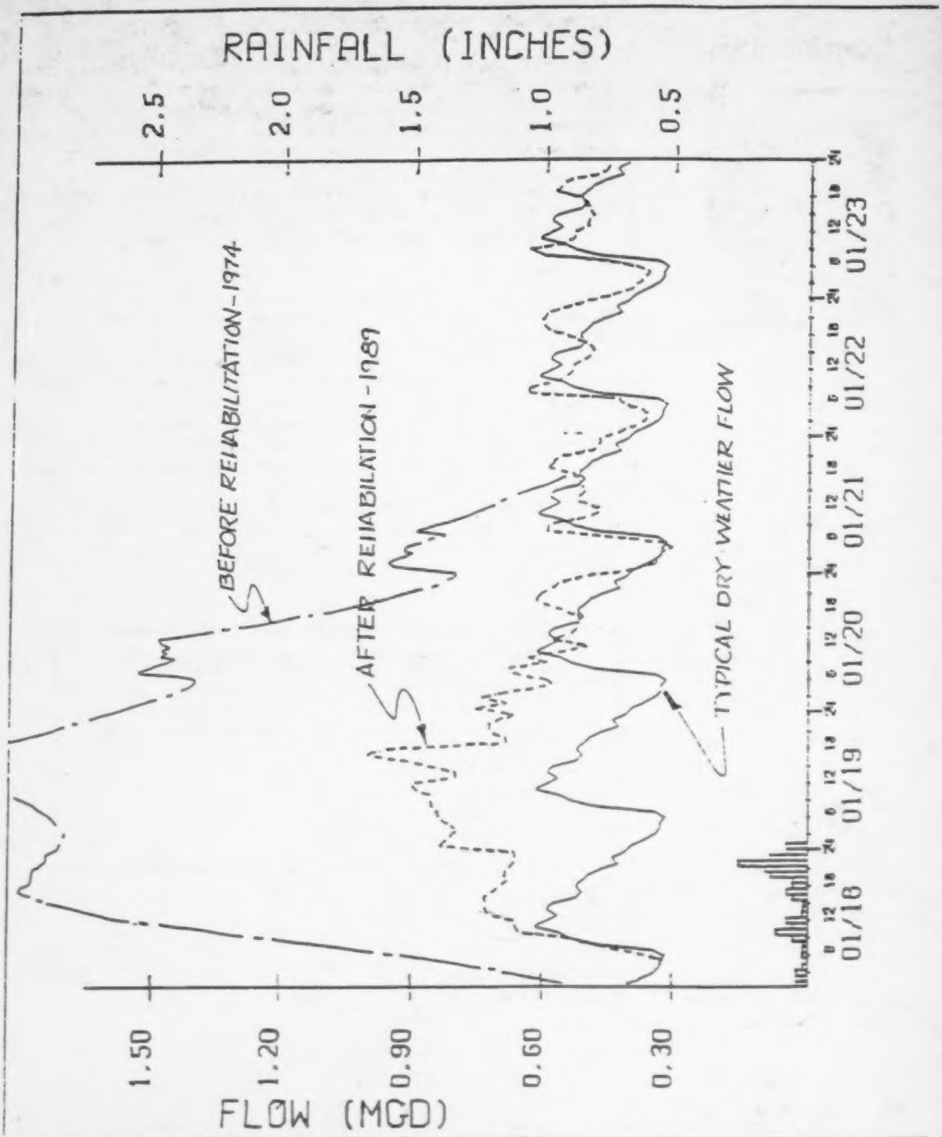

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STATEMENT OF

THE HONORABLE DON PLUSQUELLIC

MAYOR

AKRON, OHIO

on behalf of

THE NATIONAL LEAGUE OF CITIES

on the

THE CLEAN WATER ACT

before the

SUBCOMMITTEE ON WATER RESOURCES

PUBLIC WORKS AND TRANSPORTATION COMMITTEE

U.S. HOUSE OF REPRESENTATIVES

April 4, 1990

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Mr. Chairman, members of the committee: I am Don Plusquellic, Mayor of Akron, Ohio and a member of the National League of Cities Energy, Environment and Natural Resources Steering Committee. I am here today to testify on behalf of the NLC and the 16,000 cities and towns across the nation we represent on the Clean Water Act.

There are four major issues confronting the nation's cities and towns in the implementation of the Clean Water Act:

1. Federal funding commitments to assist the nation's municipalities in meeting federal clean water mandates;
2. EPA's Guidance on the State Revolving Loan Funds;
3. Implementation of policies designed to address problems with stormwater -- both combined sewer overflows and separate storm sewer systems; and
4. EPA's rulemaking process.

We are pleased to see Congress re-examine the Clean Water Act because it provides an opportunity to review whether the program is indeed working in the way it was intended or if it's implementation merely frustrates the efforts of local governments to meet federal environmental mandates.

Let me be clear at the outset, in the most emphatic way possible, that the elected officials in the nation's cities and towns support initiatives and efforts to clean up environmental problems and to make investments in preventing further pollution.

But our support is tempered by reality. We are rapidly approaching a critical overload. Just in the last two years, municipalities across the nation have been confronted with the following federal environmental mandates. In all but one case these mandates must be funded solely out of local revenue sources:

- o proposed new standards for municipal solid waste landfills -- $887 million* annually;
- o regulations to reduce lead in drinking water -- $1.2 billion;
- o implementation of surface drinking water treatment requirements -- $3 billion in capital costs; $500 million in annual operating costs;
- o construction of municipal secondary treatment plants to serve current population needs -- $69 billion; (federal contribution of less than $15 billion)
- o replacement of existing municipally owned underground storage tanks -- $2.3 billion.

* Source of cost estimates: U.S. EPA.

Mr. Chairman, these four programs alone will require municipalities to spend close to $62 billion! Furthermore, this $62 billion does not include:

- o implementation of separate storm water sewer management program -- cost unknown;
- o implementation of EPA's CSO guidance -- cost unknown; (EPA's cost estimate for 320 CSO systems with plans is $16.4 billion; but there are 1200 cities with CSOs);
- o clean up of municipal sites on the National Priorities List -- cost unknown;
- o implementation of SARA Title III -- cost unknown;
- o complying with financial assurance requirements for underground storage tanks, a program from which the federal and state governments are exempt -- cost unknown.

We in America's cities have heard the battle cry of "No New Taxes." We have also seen more and more of the federal financial burden shifted to the backs of states and cities without any idea of where we will obtain the additional monies to fund these programs. But the cities don't have anywhere to pass the buck. It stops with the cities -- and the local taxpayer.

Please let me remind you, if indeed this critical overload of new programs topples some of America's cities or towns into bankruptcy, none of these environmental objectives will be attained.

I would note that the federal government has agreed to obligate the American taxpayer to spending over $300 billion to bail out failed savings and loan institutions. The bailout is exempt from the budget process. It is exempt from Gramm-Rudman-Hollings. It is exempt from the annual appropriations process. It is exempt from the authorization process.

But no human health is at stake. Perhaps it is important to help the savings and loan industry, but why do we discriminate so much against our environment? If our water, air and land can no longer sustain a reasonable quality of life, what difference does it make if we have sound savings and loan institutions?

We know these are difficult times, but we cannot be paralyzed from acting. Cities are investing in a clean environment. This year Akron spent $20 million of its $80 million local capital budget on clean water. States are investing in a clean environment. It appears only the federal government is reducing its commitment to the environment. That unfairness is behind the breakdown in our partnership.

We have no sense that there are federal priorities among the variety of environmental problems we are required to address. While conceding that it will be no easy task, we must begin to prioritize our environmental protection agenda. The federal government says it can no longer afford to help finance its mandates; state and local governments cannot afford to pick up the tab alone. When everything is a priority, nothing is a priority. Together we must arrange our environmental problem-solving agenda into something more orderly than we have now if we are serious about environmental protection.

I'd like to address the four major issues I mentioned earlier:

1. Federal Funding Commitments

Funding for the program was cut by slightly over $40 million in fiscal 1988 -- and it would have been substantially more had it not been for Congress' refusal to appropriate funds for an unauthorized program the previous year -- by $450 million in fiscal 1989, and by $400 million in fiscal 1990. Now, the Administration is seeking to cut the program by $800 million for fiscal 1991, and claiming it is a $600 million increase in funding for the SRF!

Even once an appropriation is signed into law, we have no ability to count on it. Last year, the House and Senate Appropriations Committees considered administration proposals to cut current funding levels more than six months after they became law. Congress cut clean water funds to pay for the so-called war on drugs. They were cut again by Gramm-Rudman-Hollings. It becomes impossible to plan, at either the state or local level, if we never know what resources will be available to us.

As the federal government moves to eliminate federal grants entirely and encourages the use of tax-exempt financing, moreover, the concern about consistency increases. Any federal action which undercuts our ability to finance bond funding further interferes with our ability to comply with environmental mandates.

Currently the Congress is considering the administration's

Family Savings Plan. This plan, which is estimated to cost $20 billion a year in the out-years, competes directly against our ability to finance bonds, for it offers a higher return that is federally guaranteed than we can pay.

If the federal government wants us to meet federal standards through a State Revolving Fund which relies on bond financing, than we cannot afford a Family Savings Plan. If we are to have a Family Savings Plan, then it seems to us the federal government bears some responsibility to secure an alternative source of financing to meet its own mandates.

2. EPA's Guidance on the SRF

Recognizing the deficit problems facing the federal government, and being willing partners in supporting your efforts to get your fiscal house in order, NLC supported moving to a revolving loan program as an alternative mechanism for providing financial assistance to municipalities that had not yet met the law's requirements for secondary treatment of all wastewater.

The system established in the act, providing 80 percent federal money to be matched by a 20 percent state contribution to a revolving loan fund, seemed reasonable, in light of the federal government's financial plight, to municipalities which now would be required to finance 100 percent of the cost of constructing these federally mandated facilities.

You can imagine our dismay when no one in Congress raised any objection to EPA's guidance on the SRF allowing the states to use interest paid by local governments on loans from the SRF to meet their matching share requirement. Our perception was that we'd been "had." Not only will municipalities who were not top priorities for funding with grant money now have to pay 100% of the construction costs, they will have to pay the state's matching share as well.

This provision in the guidance clearly will increase the interest rates local governments, in states that avail themselves of this authority, will have to pay on loans from the SRF and consequently increase costs to local taxpayers -- all of whom have already been taxed to pay for the construction of facilities in other cities that received 75 percent or 55 percent federal grants.

3. Implementation of Stormwater Control Policies

I can assure members of this committee that the nation's cities and towns are looking at what is yet to come -- programs to control pollution from stormwater runoff -- with fear and trepidation.

At a recent steering committee meeting we discussed the issue of combined sewer overflows. Presenters on the issue indicated that municipalities with combined systems face potential estimated costs between $50 and $100 billion over the next several years to address control of pollution from "storm events." And this does not account for what has already been spent by local governments, with local tax dollars, in addressing the problem.

In 1979, Akron spent $79 million just to control -- not eliminate CSOs. Today's figure is more like $180 million. San Francisco has spent over $500 million on its CSO and estimates it will require an additional $300 to $400 million to complete the job. We have also seen proposed separate storm sewer regulations, and, while no cost estimates for implementing whatever program EPA ultimately devises have been developed, we fully expect the program to be of a magnitude at least comparable to the cost of fixing combined systems.

When, by EPA's own estimates, it will require "$67.9 billion to satisfy all categories of need [for wastewater treatment] for the current (1988) population," where are we going to find the resources to meet subsidiary water pollution control financing needs?

While cities and towns are spending millions of dollars as we move toward managing CSOs, stormwater and continuing wastewater treatment requirements, we are receiving far too little technical and policy assistance from the federal government.

There is a limit to the capacity of municipalities to raise funds for these requirements. Where the environmental and public health benefits can be clearly shown, the voters on bond referenda and local taxing entities usually respond well. However, where there is no clear benefit but only extensive studies, repetitive tests, and uncertain requirements, there is no way to "sell" our citizens on the merits of approving funding for these mandates. By way of illustration, Akron's sewer rate increases have averaged 15% per year over the last four years.

We need help and we want to reinvigorate our flagging partnerships at all levels of government to meet our clean water needs. We are frankly concerned, however, that EPA will be tempted to rely solely on its enforcement powers to give the impression that it is dealing with the problem. We have already been publicly designated as "environmental profiteers" by the United States Attorney General, and we note with dismay that "enforcement" is one of EPA Administrator Reilly's four top priorities. We ask you, as we have EPA, to work with us on solutions, not just rhetoric.

4. EPA's Rulemaking Process

Congress approved a management program for separate municipal stormwater sewers in the 1987 amendments and mandated that municipalities with populations in excess of 250,000 file applications for permits by February 4th of this year. February 4th has come and gone, the requirement to file permit applications is in effect, cities failing to file the required permit are subject to enforcement actions and citizen suits and we have yet to see for what sort of a program we are to file an application. One cannot judge from the proposed guidance where the agency is headed with this program, so in this case a best guess isn't even possible.

Clearly, EPA needs either additional resources, or additional time -- or both -- to meet Congressional deadlines. We simply cannot continue a process in which cities and towns are vulnerable to enforcement actions and citizen suits because another level of government was unable to meet Congressionally-mandated deadlines.

Thank you for the opportunity to present my views and those of the National League of Cities on this issue. I would be happy to answer any questions you may have.

TESTIMONY OF

Congressman Nick J. Rahall

TO THE

House Public Works and Transportation
Subcommittee on Water Resources

In Support of H.R. 3930

April 4, 1990

Mr. Chairman. I greatly appreciate the opportunity to testify before your subcommittee today. I would like to take this opportunity to request your support for H.R. 3930, legislation to reauthorize the Title II construction grants program, which expires at the end of FY1990.

As you know, the Environmental Protection Agency's National Needs Survey 1988 Report to Congress on wastewater construction needs demonstrates that, as a nation, we have yet to fully attain even minimum national objectives for health based sewage treatment. The survey reports over $26 billion in unmet construction needs for secondary treatment and attainment of state water quality standards for conventional pollutants. Altogether, unmet needs for municipal water pollution control totals $83.5 billion under the Clean Water Act's framework.

As you also know, the Title II construction grants program will be phased out this year in favor of State Revolving Loan Funds (SRFs). Essentially, this program will place the burden of meeting the Clean Water Act's requirements squarely upon the shoulders of state and local governments. After 1994, the federal government can wash its hands of any further assistance.

I am very concerned about the SRF program. The expectation is that the Federal contributions to SRFs, beginning in FY1989, will assist in making a transition to full State and local financing by FY1995. Federal funds devoted to this program since FY1989 total approximately $2 billion. Federal funds authorized for support of this program from FY1991 through FY1994 will total only $6 billion. States are required to match this commitment by 20%, which would provide an additional $1.6 billion. Therefore, even if we appropriate the balance of the funding authorized, which has not been the pattern to date and is not likely again this year since the President only requested $1.6 billion for support of SRFs, and the states fully meet their requirement under the act, the SRF will be able to provide a total of only $9.6 billion. This represents only 36.9% of the funds needed to meet our unmet construction needs for secondary treatment and attainment, and only 11.5% of the funds necessary to meet our total unmet needs for municipal water pollution control.

In addition, as you are fully aware Mr. Chairman, there is a significant difference between a grant program and a loan program. Loans must be repaid with interest. This new program may favor the Federal Government by allowing it to remove itself from assisting local governments in the construction of sewage treatment facilities, but it does not favor small, economically distressed communities present in West Virginia and in other parts of the country. These communities cannot afford to repay loans and depend upon an infusion of funding to meet their needs and the requirements under the act.

In a 1989 report entitled, Small Community Infrastructure, the Council of Infrastructure Financing Authorities estimated that fully 55% of municipalities with a population less than 2,500 would experience 50% and higher increases in user charges from the cumulative impact of environmental regulations. The report further estimated that 26% may be unable to issue revenue bonds or obtain bank loans, and up to 30% may fail to issue general obligation bonds. Therefore, the report indicated that a majority of small communities would either need subsidized loans and grants or would require grants to proceed.

I believe that it is clear that the SRF program will not meet our growing unmet water treatment needs alone. It will not be given the funds necessary initially, nor will it generate the funds necessary. Further, the SRF program may very well assist large communities that can afford to repay loans, but it will do very little and in some cases nothing, for small communities.

I see no reason why the SRF program and the Title II construction grants program cannot coexist. Reauthorization of the grants program will provide additional funds which are obviously necessary to meet our nation's total unmet needs. In fact, the two programs could very well complement each other and provide two different forms of assistance for communities with different needs and ability to pay. Reauthorization of the Title II grant program will also ensure that the smallest and poorest communities have the possibility of drinking safe water.

I would greatly appreciate the support of this committee for my bill and I urge you to hold hearings on the merits of the bill. Thank you again for the opportunity to testify before you today.

TESTIMONY OF ROBERTA SAVAGE

ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Testimony before the
House Subcommittee on Water Resources

April 1990

Mr. Chairman, Members of the Subcommittee:

My name is Roberta (Robbi) Savage, Executive Director and Secretary Treasurer of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). ASIWPCA is the national non-partisan organization of State water professionals responsible for the implementation of this nation's water quality programs.

The Association commends the Subcommittee for its strong support of State Clean Water Programs and we are pleased to have this opportunity to share our views on the implementation of the 1987 Clean Water Act.

Summary: The States believe the 1987 Amendments are fundamentally sound, but are also convinced that mid-course corrections are appropriate. ASIWPCA submits that:

- **State Management**: Underfunding of State management programs needs to be addressed, particularly with the creation of a separate funding authorization for the permit and enforcement program.
- **State Revolving Loan Fund:** The $18 Billion Congressional commitment to municipal wastewater treatment should be fully funded before the authorization expires in 1994. Legislative refinements to streamline the program are essential if States are to maintain viable programs which are responsible to local needs.
- **Other:** State implementation of the 1987 Clean Water Act has been unduly delayed because of the failure to finalize USEPA implementing policy for toxics, stormwater, and sludge programs. And, the approaches proposed need significant refinement if States are to achieve meaningful environmental results for the resources available.

I. FUTURE FUNDING FOR STATE MANAGEMENT

Adequate funding of the States' water pollution control programs should be achieved commensurate with national expectations for performance. The States have identified a need for at least $140 million in Federal funding to offset elimination of Title II setasides and maintain a reasonable Federal share in program operation. Current program costs exceed $600 million nationally to implement the baseline State Clean Water Program.

RECOMMENDATIONS:

1) **Section 106: 106 funding should continue to support water quality planning and standards, ambient surface water monitoring, groundwater activities and other relevant (but non-NPDES) program activities.** The Association supports the President's proposed FY 1991 funding of $81.7 million for Section 106 as a positive step towards achieving adequacy.

2) **NPDES: The funding for States' participation in the NPDES program should be addressed on its own merits.** Sufficient funding should be provided to ensure that permitting, compliance inspection and enforcement functions are properly administered. The States' 1989 funding contributions should constitute the match for this increased Federal support. The President's proposal for $16.5 million in new funding should be allocated to the Section 402 NPDES program. States would like to see this funding provided as an adjunct to the 106 State Management program with work outputs incorporated into the 106 workplan.

II. STATE REVOLVING LOAN FUND

The States were primary advocates of the State Revolving Loan Fund (SRF) program incorporated in the 1987 Water Quality Act. States are convinced that adequately capitalized revolving loans are the most viable mechanism for funding municipal wastewater treatment and other pollution control activities, such as stormwater management.

The Covenant and Its Guiding Principles -- As part of the 1986-1987 reauthorization process, State and local governments reached a covenant with Congress and the Administration to transfer more than $83 Billion in wastewater treatment needs to State and Local governments in exchange for an $18 Billion upfront commitment from the Federal government to serve as transition funding to seed the SRF. In addition, States were guaranteed a flexible regulatory program and cash payments which would ensure the accrual of interest to perpetuate the growth and stability of the SRF.

All parties agreed to build a workable program, wholly State managed, with minimal Federal requirements. Unfortunately, the program has fallen far short of achieving these goals. (See interview with Congressman Boland.)

RECOMMENDATIONS:

1. FULL FUNDING -- **Full funding is needed to accomplish the goals of the 1987 Water Quality Act. The appropriation for FY 1991 through 1994 should be adjusted accordingly to complete the $18 billion commitment in a timely manner (e.g. a sustained $2.0 Billion level).**

   States urge the Committee's active and strong support in both the budget and appropriation's process. At the levels now being contemplated, the SRF cannot achieve what it was created to do in the 1987 law. Significant needs, such as those for combined sewer overflows, are for the most part, unaddressed in the $83 Billion needs estimate. For this reason, ASIWPCA is establishing a special Task Force to consider the viability in retaining the $2.4 billion municipal construction assistance appropriation to enable States to address combined sewer overflows, toxic pollutants, stormwater correction, and other needs which gained emphasis since the passage of Title VI.

2. SIMPLIFICATION -- **To operate effectively, SRF requirements must be as simple and straight forward as possible. Restrictions in the law and USEPA requirements undermine SRF viability, and:**

   a) increase project costs up to 20-30%,
   b) decrease SRF attractiveness to local governments,
   c) eliminate the opportunity to accrue interest because of the imposition of the Federal Letter of Credit, and
   c) greatly complicate administration.

   Cumulatively, the environmental and social commitments, coupled with the Tax Act and financial management restrictions, require expenditure of tremendous State and Local resources. This is difficult to justify, particularly since the Federal program covers only a small portion of the total needs. While States can offset the impacts by lowering interest rates and leveraging program resources to expand the size of the fund, this requires a significant and sometimes prohibitive State investment which can erode the fund's corpus.

   USEPA Requirements: As currently structured, especially with the imposition of the more than 2 dozen cross-cutting Federal requirements, the SRF is as much or more of a Federal than a State program. **At a minimum, the application of Federal requirements should cease after the first round of loans.** And, the Agency should:

   * **Eliminate application of Title II grant requirements once the enforceable requirements of the statute are met.**

   * **Eliminate the possibility of Inspector General audits in perpetuity (e.g., after the Federal funding has been terminated).**

   * **Eliminate the letter of credit** which restricts State ability to accrue interest and delay program implementation.

- **Rely on the nation's Governors to determine compliance with the requirements of the law as specified in statute** (Section 604(b)(5) and (6)).

- **Implement the Single Audit Act** to eliminate duplication and maximize use of expertise in the private sector.

Crosscutting Laws -- Other Federal laws should not apply to projects receiving SRF loans -- There are over 25 such laws at the present time and the number is likely to increase. The cross-cutters increase project costs, impose program uncertainty, discourage local participation, and impede water pollution control.

20% Cap -- Allow full use of the SRF (vs. the current 20% limit) to address priority water quality problems that can be remedied by *"non-core" projects* such as those for nonpoint sources, rehabilitation, combined sewer overflow correction, or collector sewers.

Tax Law -- Simplify State and Local reporting requirements -- The 1986 Tax Law has a profound impact on State and local government due to prescriptive record keeping requirements for loans and repayments related to arbitrage, rebate, private purpose use, and tax exempt bonding.

3. **ADMINISTRATIVE COSTS -- Administrative costs in Section 603(d)(7) should be based on 4% of the authorized level** -- with a $400,000 minimum per State. States should also be able to also use non-Title VI funds for SRF administration. 4% of the appropriated USEPA grant amount is not sufficient to administer this complex program. And, according to USEPA, the law allows use of no SRF funds for such purposes after 1994, (i.e. 4% of zero is zero).

4. **LAND ELIGIBILITY -- Land, easements and rights of way should be eligible for funding under Section 603(c).** They are integral to a facility and can be substantial in cost. Unless the SRF can provide communities with "one stop shopping", project costs will increase and the SRF will be a less attractive financing mechanism.

5. **SMALL COMMUNITIES -- Experience with the SRF has shown us that some small, financially hard-pressed communities will be unable to payback loans.** This issue should be examined in more detail. Even if States are able to highly subsidize interest rates, many hardship communities are having difficulty in complying with pollution abatement laws. In devising solutions, it is of paramount importance to:

- Continue building momentum in the State Revolving Loan Fund,

- Avoid compliance delays at the local level, and

- Achieve an integrated approach to financing under the auspice of the SRF.

As this Subcommittee will recall, the original House bill in the 1987 reauthorization cycle provided a small grant program for small and hardship communities. That approach may be worthy of reconsideration, but should be considered under the SRF umbrella to avoid balkanizing financing programs.

STATE PROGRAM STATUS:

Significant progress has been made since February 1987 in establishing SRFs. At the end of FY 1989 there were 43 State and Territories with approved SRF programs. ASIWPCA anticipates that an additional 7 States will be approved within six months. Full SRF funding is clearly needed to build a strong SRF. ASIWPCA estimates that in the next 4-5 years, States will need $45 Billion to initiate and complete 7,588 projects. Of these projects, needs relate to:

40%	maintain future compliance,
36%	address water quality and/or public health problems,
33%	address small communities (generally less than 3500 population), and
13%	comply with the National Municipal Policy.

[A project may have more than a single need or justification.]

Impediments to Program Start-Up: Program implementation has not been as expeditious as States had anticipated because:

1. Under-capitalization of the fund has raised questions regarding the Federal commitment.

2. The program is managerially and fiscally complex.

3. In order to meet the Congressional deadlines, States had to initiate the SRF in advance of USEPA policy. It was virtually impossible for States to anticipate and comply with USEPA directives, without causing delay.

4. The 1986 Tax Act raised many legal and procedural issues.

5. State financing had to be secured through State legislatures and bond markets, which is a protracted process in most instances.

6. Local communities had to be thoroughly briefed on the SRF, requiring significant marketing by the States.

III. ELIMINATION OF TOXICITY

SECTION 304(l):

The Association supports strong programs to address toxic impacts from all sources. We concluded early in the 1980's that the traditional approach to the development and use of water quality standards, effluent guidelines, and permit programs would be inadequate.

Therefore, the States and ASIWPCA have been at the forefront of efforts to advance the state-of-the-art and eliminate toxicity.

Section 304(l) has been a valuable exercise in providing a snapshot of some toxic pollution problems. However, 304(l) is but one aspect of a much broader and more ambitious State and Federal effort to control toxics of all descriptions from a myriad of sources.

RECOMMENDATION: Section 304(l) should not take precedence over other efforts to control toxicity. Congress should direct USEPA to begin integrating 304(l) into the overall base planning, monitoring, permitting, and enforcement program. Follow-up to 304(l) requirements should be in the context of, and consistent with, ongoing programs to address priority problems.

1. **304(l) In Perspective** -- Section 304(l) was a "one time" initiative. A relatively small number of waters were included on the "short list" under Section 304(l)(1)(B). Any assumption that 307(a) priority pollutants were the primary cause of stream use impairment has been proven invalid based on the 304(l) listings and State documentation. In many cases the required individual control strategy limits were already in place or under development prior to listing pursuant to ongoing toxics control programs.

2. **Process Difficulty** -- The implementation process was extremely complex and troublesome. USEPA regulations were promulgated June 2, 1989 -- well after the final State submission deadline of February 4, 1989. State submissions had to be developed without clear, uniform standards nationwide. As a result, the listing process and the associated individual control strategies created unnecessary controversy between USEPA, the States, Local governments, and constituency groups.

3. **Delay and Disruption** -- Overemphasis on the Section 304(l) process has, in many instances, delayed implementation of vital programs. Critical resources had to be diverted to Section 304(l) from permitting, the control of discharges of non-307(a) toxic pollutants and management of nonpoint sources related to agriculture and urban runoff. In most cases, the impacts of toxics on water bodies were known, and the sources involved were available in a more usable form.

WATER QUALITY STANDARDS:

1. **Need for State Leadership** -- The adoption of water quality standards for toxics consistent with Section 303(c)(2)(B) is a high priority for the States. ASIWPCA strongly supports State, rather than USEPA, adoption of standards. Review of State accomplishments, since enactment of the 1987 Clean Water Act, clearly demonstrates progress toward achieving this most ambitious and complex goal.

   There has been some thought, recently evidenced by a January 26, 1990 USEPA policy memorandum that USEPA promulgation of nationally applicable standards for priority pollutants will speed up implementation. We strongly disagree. The standards setting process for toxics is time and resource intensive. The complexities require tremendous effort to sort through seemingly endless technical judgments. For any parameter, three years is generally required. Decision making is complicated when the criteria suggested by USEPA (10^{-6} for human health) have not been formally published under 304(a). And, there are significant inconsistencies between surface water standards and other USEPA program risk levels which raise concerns.

More than just standards adoption is at stake under the law. In the Clean Water Program, we cannot rely solely on forcing implementation through enforcement actions. The process involves not only determination of the best science, but also considerable education. The extensive discussion and public involvement that takes place builds much needed support to translate standards into implementation action -- particularly for toxics criteria which can such a significant impact.

While State adoption of water quality standards takes considerable time, it is well worth the effort. USEPA should recognize good faith State efforts and not stymie their further progress.

> **RECOMMENDATION: Federal promulgation should be a last resort, as significant delays will most assuredly result as the nation must await the outcome -- most likely in the courts.** States should establish agreements with USEPA, identifying a schedule for standards adoption and the areas that need to be updated to comply with 303(c)(2)(3). USEPA could provide incentives by exempting such States from the Federal default standards if they are on schedule at the time of promulgation. In addition, water quality standards deserve higher priority in USEPA for criteria development, technical assistance to States, national consistency in the application of USEPA policy, and updating BAT requirements.

2) Criteria -- Under the law and USEPA policy, States could adopt:

- numeric water quality standards for all priority pollutants that may reasonably be expected to impact water uses of the State, and/or
- comprehensive narrative standards with enforceable procedures for translating such standards into specific numeric effluent limits in NPDES permits.

This flexibility is critical because each of the approaches has advantages and disadvantages. Their efficiency and effectiveness in controlling pollution can vary widely. While USEPA guidance supports these alternatives, there is an emerging tendency toward only the numeric approach. Adoption of specific numeric criteria can be a lengthy process which is not always technically possible or legally defensible. If such a restrictive philosophy were adopted, States are convinced that in many instances a tremendous amount of time and resources will be wasted with no attendant benefits in terms of toxic substance control.

RECOMMENDATION: The flexibility to develop numerical and/or narrative standards should be maintained.

2) **Fish Advisories** -- With the restoration of the nation's waters has come increasing demand for recreational fishing. Fish tissue/contamination monitoring and the issue of advisories is typically a joint effort by several agencies in a State: the water pollution control agency, department of health and the fish and wildlife agency.

No one resource agency has been positioned to spearhead the identification and resolution of issues. As a result, significant points of departure now exist among the States and between Federal agencies. The problem becomes acute in cases of shared waterbodies where conflicts have arisen concerning the issue of advisories. Among the fundamental questions needing resolution are: 1) the number and type of samples necessary for detection of consumability, 2) appropriate analytical methods, and 3) appropriate use of the risk based approach.

RECOMMENDATION: The Federal agencies having some jurisdiction in fish contaminant programs should jointly develop a uniform Federal approach to serve as the basis and model for:

- State agencies in their acquisition and analysis of fish tissue contaminant data, and

- The issuance of necessary consumption advisories for surface waters.

IV. STORMWATER AND SLUDGE

States have been very concerned about the delay in USEPA promulgation of regulations for stormwater permitting and sludge use and disposal. Critical deadlines have past and others loom on the horizon -- many of which require State compliance. And, the grandiose permitting and control programs proposed by USEPA would overwhelm State and Local programs -- further delaying controls at great cost to program credibility. Unless significant additional Federal resources are forthcoming, major cuts in other programs -- ***including toxics controls and nonpoint sources*** -- will be necessary. Even if such additional resources were to become available, they may be better invested elsewhere.

RECOMMENDATION: While there are important concepts which should be retained in the USEPA proposed regulations for stormwater and sludge, the massive new programs envisioned are causing undue delay. They cannot be justified, in light of their limited potential to improve control of toxics and other water quality problems, and cannot be validated scientifically.

If concern for toxic impacts from stormwater or sludge management practices is the primary justification, a far more targeted and less resource intensive alternative should be developed. USEPA should substantially restructure the proposed rules to **systematically focus** on sources causing significant toxic and other water quality problems using a **limited permit program** to address them. The rules should make optimum use of existing data and State programs to minimize delay and the need to divert resources.

V. NONPOINT SOURCE CONTROL

Section 319 of the 1987 Water Quality Act places a national priority on the assessment and control of nonpoint sources. We are pleased to report that nonpoint source control is becoming a significant component of State water quality programs throughout the nation. However, problems remain to be addressed

SECTION 319:

1. **FUNDING** -- The full attainment of water quality standards for much of the nation's waters will only be accomplished with State management of nonpoint pollution sources. At the Federal level the program is long on demands, expectations, and requirements and short on funding. States were profoundly disappointed by the delayed funding for Section 319. There is no question that this hinders progress. States estimate from 1988-1992 that over $103 Million will be required to manage the State nonpoint source program under the 1987 Amendments -- in addition to specific project funding. While Section 319 is targeted to demonstration projects, more comprehensive efforts over the last several years were supported in large part by Section 205(j) funds. With the elimination of Title II funding in 1991, nonpoint source activities in many States will, in all probability, be drastically curtailed.

   RECOMMENDATION: Section 319 should be supported, at a minimum, at levels consistent with the level appropriated in FY 1990. Congressional appropriations should be continued until the total authorized level of $400 million has been achieved. Comprehensive State nonpoint source management should be supported on an ongoing basis by Section 106.

2. **Section 319 Process** -- While States agree that quality assessments and management plans are critical, they should not become an end in themselves but should be used as a State road map for decision making and resource allocation.

   We are disappointed with the results of the Section 319 process, because State Section 319 assessments and plans had to be developed based on only general USEPA guidance. The approval process was slow, as further criteria evolved. States are concerned, for example, that the Agency has focussed more on volume than on results. There a growing concern that the Section 319 process is becoming too onerous and bureaucratic, diverting attention from the intended result -- achieving nonpoint source control.

   RECOMMENDATION: USEPA, in overseeing State activities, should emphasize achieving actual progress in nonpoint source control.

FUTURE STATE CHALLENGES:

1. **Monitoring** -- State and Local governments need to **expand their monitoring programs** in order to enhance program expertise. By its very nature, nonpoint pollution poses complex monitoring problems. Correlating observed water quality degradation to sources involves linking together pieces of a puzzle with transport systems, diverse contaminants and spatial and temporal proximity.

2. **Watershed Management** -- **Watershed management, while necessary, is difficult and time consuming to achieve.** Hence, most States must place immediate priority on establishing the nonpoint source program statewide and focus longer term attention on watershed management. This is not an easy task. Monitoring may indicate significant waterbody degradation without yielding specifics on either contaminants, abatement, or cleanup. Most technology has been geared to point sources where controls can be readily directed at quantifiable levels of pollutants. For nonpoint sources, pollutants require much more analysis of diffuse sources. Addressing one layer of pollutants, like an onion, reveals more complex problems.

3. **Institution Building** -- **Institutional issues continue to be very important,** since the numerous agencies impacting nonpoint sources need to become more involved in a cooperative effort. A concerted effort to streamline program management at the Federal and State levels should be made.

4. **Public Education** -- **Expanded programs for public education and citizen involvement** are essential for effective management.

USEPA ROLE:

It is important to the States that USEPA focus more on the following areas:

1. **Federal Consistency** -- **A meaningful policy on Federal agency compliance with Section 319 is needed.** USEPA needs to take a lead role in assuring their coordination and cooperation. With the U.S. Department of Agriculture's increasing attention on water quality in a **$70 Million program** and the Office of Management and Budget's stated desire to transfer **all the nonpoint source program** primarily to that Department -- USEPA may need **some Congressional reinforcement.** Without the State 319 program and the USEPA to **lead the way,** it will be virtually impossible to achieve significant water quality **benefits with USDA funds.**

2. **Technical Activities** -- **USEPA should focus more on the national technical needs of the nonpoint source program.**

   * USEPA should provide the necessary **nonpoint source research and development.** Reducing contaminants entering waterbodies is far more effective than trying to treat those waters to remove contaminants,

- USEPA should concentrate on **standards and monitoring protocols** (e.g. for sediment). Current water quality standards and monitoring do not adequately address these basic issues,

- USEPA should **update and revamp STORET** to address nonpoint source concerns, and

- USEPA should **expand and refine Best Management Practices (BMPs)**, especially for urban areas. Local successes should be shared with USEPA working as a clearinghouse, facilitator, and technology promoter.

FARM BILL:

ASIWPCA recognizes the important role that the 1990 Farm Bill has in the protection and restoration of the nation's water resources.

RECOMMENDATION:

1. **Consistency with Section 319 Plans** -- All water quality related activities under the Farm Bill should be consistent with State nonpoint source pollution control and management plans approved under Section 319 of the Clean Water Act.

2. **Certification** -- Any water quality protection project or program initiated under the Farm Bill should not proceed until the Section 319 lead agency or the State water quality agency certifies its consistency with the State program approved under Section 319 of the Clean Water Act.

ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

Testimony before the
Senate Subcommittees on Environment Protection and
Superfund, Ocean, and Water Protection

July 12, 1989

Mr. Chairman, Members of the Subcommittees:

My name is Linda Eichmiller, Deputy Director of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). ASIWPCA is the national non-partisan organization of State water professionals responsible for the implementation of this nation's water quality programs. The Association commends the Subcommittees for their strong support of State Clean Water Programs. The States are pleased to have this opportunity to discuss our views on protection of marine waters.

States share the Congressional concern on the need to protect oceans as well as other water resources from pollution. Members of the Subcommittees have been very thoughtful in the development of S. 587, 1178, and 1179. The bills address many vital issues and:

.. Recognize the need to progress into new key areas such as acid rain and sediment standards.

.. Endeavor to rejuvenate critical ongoing activities related to oceans protection such as planning, integration of government activities at all levels, criteria development, standards setting, control of combined sewers and stormwater permitting.

In considering legislation, the States encourage the Subcommittees to:

1) **Recognize the value of the extensive ongoing efforts** to protect and enhance marine waters underway in the States -- often against formidable odds given the limited funds available and complex issues involved.

2) **Build on the institutions and activities already in-place** to promote further efforts without delay.

3) **Vigorously support full funding for water programs as the primary Federal responsibility** in the State/Federal partnership.

4) **Distinguish between situations** where 1) legislative authority exists to solve problems but is not adequately carried out -- i.e. where Congressional oversight is critically needed, and 2) inadequate authority exists -- i.e. where further legislative action is needed.

5) **Avoid reporting and unrealistic requirements or deadlines** that divert resources from ongoing comprehensive programs and fractionate the control of marine pollution under a plethora of separate programs or offices.

6) **Recognize marine pollution problems can be complex.** The answers are frequently not readily apparent, and remedies are time consuming and often protracted.

GENERAL COMMENTS ON S. 587, 1178, AND 1179

1) The CLEAN WATER ACT IS THE BEST VEHICLE for addressing marine problems.

2) MANY OF THE ACTIVITIES ARE OR SHOULD BE A PRIORITY NOW that are suggested in the bills. E.g. they need no further legislation and the States want to work with Congress and the USEPA to put them fully into place.

3) THE PROBLEM CONFRONTING THE STATES IS PRIMARILY FINANCIAL. No action the Committee can take to protect oceans is more important than to secure Federal funding support at least at the authorized levels.

    a) Federal funding is eroding. Section 106 is funded at 1972 levels considering inflation and termination of the Construction Grants setasides will cripple State programs unless further action is taken.

    b) $600 Million is required to implement the Clean Water Act using very conservative programs. This is approximately twice as much as currently provided. The 106 authorization would have to be doubled -- just to maintain a 25% Federal fair share.

    c) It is impossible to solve the marine pollution problems without tackling combined sewer overflows, nutrient removal and nonpoint sources.

        .. Federal support to municipal treatment is declining precipitously. State Revolving Loan funding must be increased to the fully authorized level to achieve objectives.

        .. Federal support to nonpoint sources is virtually nonexistent. Section 319 should be fully funded.

The use of State Revolving Loan Fund money to finance marine management programs is inappropriate. Increased funding should be provided under a more comprehensive program using Section 106.

d) Unfortunately, Federal, State, and Local resource constraints, in most instances, have eliminated the availability of new funding for environmental programs. We are concerned, therefore, that new legislation not exacerbate the situation by diverting increasingly scare resources from State management of the overall national water program.

4) THE MARINE ENVIRONMENT CAN BE PROTECTED ONLY WITH A STRONG BASIC WATER program. Emphasis on oceans should not detract from, but should be an integral part of, the focus and resources of ongoing programs to address all waters. States support expanded and enhanced:

* Research programs
* Health impacts studies
* Dredge spoil disposal programs
* Monitoring and technical exchange
* Algal bloom study
* Penalty programs

The Association questions the need, however, for initiatives for point source reviews, pretreatment, etc. separate from the base water program authority and we are concerned that the bills establish marine combined sewer overflow (CSO) program deadlines which are unrealistic and unachievable at the outset. When such unrealistic deadlines are imposed, we build public expectations only to fall short in program implementation.

5) USEPA HAS NEITHER THE INFORMATION NOR EXPERTISE TO ESTABLISH SOUND WATER QUALITY STANDARDS for this nation's many marine waters. And, due to many State laws prohibiting requirements more stringent than Federal standards as well as likely objections by the regulated community to such "upgrades", such a policy would deter environmental protection. States are currently required to establish water quality standards for coastal waters and assess whether water quality goals are being met. Standard setting should remain a State responsibility, with far more USEPA attention allocated to developing sediment and other marine criteria.

Except as related to public health protection and water-contact activities, numeric criteria are especially difficult to evaluate in marine waters because of natural chemical and physical conditions as well as in-place pollution. They also have limited usefulness in contrast with biologically based approaches.

6) STORMWATER PERMITTING REQUIREMENTS ARE JUST BEING IMPLEMENTED under the 1987 Water Quality Act. It is premature to amend those provisions at this time. In our judgement, any action to do so will only delay local implementation.

DISCUSSION

The bills before the Subcommittees appropriately add emphasis and direction to the Clean Water Act requirements for oceans protection. It must be recognized, however, that the ongoing water programs do not end at the coast. Water quality standards, effluent limits, toxics control, stormwater, nonpoint source programs and CSO programs all currently apply to coastal as well as fresh waters. These programs can be very effective in addressing marine problems.

Funding -- The biggest impediment to protecting and cleaning up coastal waters is the vast costs to implement comprehensive management plans. For example, as much as $6 Billion would be required just to clean up Long Island Sound. Focusing more resources on additional reports and inventories or altering existing permitting programs won't solve the problem and may, in fact, delay implementation.

Watersheds -- Oceans and bays receive the wastes from many rivers and land uses. Increasing reporting, monitoring, enforcement, standards development and control of pollution sources along an arbitrary coastal shoreline may not enhance water quality or improve living marine resources. Water quality management programs must comprehensively address inland **and** coastal waters as a whole.

For example, in Connecticut all freshwater streams drain to Long Island Sound. In fact, much of the waste from Massachusetts, Vermont and New Hampshire is drained by the Connecticut River, contributing more than two-thirds of the freshwater discharge to Long Island Sound and much of the pollution. Clearly, inland water quality management activities cannot be divorced from water quality strategies for the Sound. An unwarranted focus on specific direct discharges to coastal waters may, in fact, impede overall progress because of the inland relationship to coastal water quality.

New efforts are needed to control the collective impact of multiple sources of pollution to marine environments with models of waterbodies, wasteload allocations, nutrient removal and control of air and river sources. Comprehensive evaluations of larger water bodies are a logical step in the evolution of State water pollution control programs. Solutions will require new control measures directed at the problem sources which:

1) are not just water pollution or coastal sources, and
2) can be implemented under existing regulatory authorities.

Integration -- Comprehensive water programs that integrate all sources of pollution should be used to address the routine activities of nonpoint and point source control, enforcement and water quality standard development. **Funding for these efforts will be most effective if it is channeled through a central source such as Section 106 that integrates efforts into a common goal of general water pollution control. A coastal focus on review is appropriate but not as a separate or new program.**

This is not to imply that all problems have been resolved, only that answers need to be developed in current programs. Research initiatives in the areas of human health risk assessment, sediment criteria, fate and transport of contaminants, and estuarine modeling are needed to enhance present day water pollution control activities. Further education and public outreach programs are critical to helping the public understand the nature and the needs of these programs and to generate support for funding.

CSO's and Nonpoint Sources -- Floatable waste and bacterial contamination originate from both marine and inland CSO's and a wide variety of nonpoint source discharges. These sources of pollution are incorporated into State priorities for the construction grants/revolving loan program and nonpoint source strategies. Any effort to enhance marine water quality must:

1) vigorously address these sources with firm, but reasonable expectations in a cooperative fashion at the Federal, State, and local levels,

2) realistically mesh with ongoing programs to assure expeditious progress, and

3) provide additional funding to large and small communities.

S. 587 -- The Association supports the objectives of S. 587. Research and planning are fundamental to effective program development. However, we are concerned that Congress not foster bureaucracy and delay. Legislation should build on the State/Federal partnership with a simple planning and funding program using existing organizations and mechanisms. Complex, new Federal organizations, etc. are not needed.

S. 1178 -- S.1178 incorporates new coastal initiatives into ongoing programs and recognizes the ongoing National Estuary Program with deadlines and reporting requirements.

Management Conferences - The provision for management conferences is consistent with current requirements and comprehensively addresses the needs of marine waters. However, States or USEPA should be able to convene these initiatives. (Page 11)

Reporting -- The majority of pertinent water resources data and expertise resides with the States. For this reason, States should be integrally involved in developing the Report to Congress. Reports should be integrated into existing documents such as the 305(b) Report. (Page 17)

Penalties -- While it may be attractive to deposit all penalties in a national fund, that would preclude many uses of those funds at the State and Local levels which have benefited water quality and deterred violations in the past. Such deposits should be optional, with the appropriate use of penalties decided on a case by case basis. (Page 19)

Point Sources -- Waste minimization and decreased loadings are sound concepts which the States fully support. The effectiveness of such efforts in achieving and maintaining standards should, however, be considered in the context of overall all point and nonpoint source control needs which can be upstream in remote watersheds. State administrative resources, in many instances, may be better invested in control of nonpoint, air pollution, combined sewers, or stormwater, rather than complicated and protracted NPDES Section 402 demonstrations for coastal sources. (page 20)

Local Management Plans -- Local plan development may be appropriate where States have not acted, since Local governments are integral partners in pollution control. However, such activities must be consistent with applicable State/Federal laws and regulations. State technical assistance and oversight is, therefore, essential. (Page 25)

Combined Sewer Overflows - As the bill recognizes, CSOs are a major pollution source with many effective control techniques. And, as with most environmental programs, prevention is more effective than mitigation, which requires extensive time and resources. As drafted, the proposal may lead to a stalemate at the Local level with penalties but no action. This is due to the short deadlines and lack of funding for the State Revolving Loan and other water programs. (Page 28)

Criteria -- Sound information providing usable marine sediment criteria is necessary for future management actions in near coastal waters. Development of the criteria is complicated and requires a concerted effort on the part of State and Federal researchers. The bill oversimplifies this point. States also question the scientific and technical validity of using a conversion factor to translate numerical ambient standards into sediment standards. (Page 38)

Registry - The registry has potential to identify valuable coastal lands. It could be linked to State and Federal programs including coastal zone management and protection programs. With the involvement of scientists and landowners, this initiative could direct attention to coastal areas which are not receiving primary focus in existing estuary studies.

S. 1179 -- The Association supports the utilization of the Clean Water Act to implement marine programs, provided there are no separate actions or distinct reporting requirements to detract from the existing programs. The Association supports:

* Comprehensive assessment activities,

* Integrated implementation strategies, and

* Research initiatives on atmospheric pollutants, health impacts, economic impacts and algal blooms. (Federal agencies should take a leadership role in implementing research initiatives to provide useful scientific data for State implementation.)

The Association opposes:

* Unrealistic CSO deadlines and specific requirements which interfere with ongoing programs that already address CSO's in all waters.

- New marine pretreatment requirements, since such programs are already being implemented consistent with the proposed requirements in the bill.

- Reliance on numeric criteria for marine waters which can be one of the least effective regulatory approaches to control toxics, as previously discussed.

Estuarine and Coastal Environments -- Plant and animal life in estuarine waters can differ substantially from those in a coastal environment. The bill should be flexible enough to accommodate such distinctions.

Nonpoint Sources -- The bill requires USEPA to assist the U.S. Department of Agriculture in reducing pollution from cropland. This can help assure adequate priority in the Federal structure. However, State Water Quality Agencies are the primary repository of environmental information and should have the lead role in identifying lands for enrollment in the Conservation Reserve. (Page 17)

Funding -- Disapproval of plans at the outset due to lack of funding is premature and counter-productive. The strategy should identify resources needed to implement the recommended plan for use as the basis of generating funding. This should be a stepwise process with appropriate timetables if sufficient funding is not immediately available to implement the plan completely. (Page 8)

Monitoring -- The bill's requirements for standardized monitoring protocols may be partially satisfied by 40 CFR 136. States should not be limited to those protocols, but should be able to use alternative monitoring methods. (Page 30)

Federal Compliance -- The bill clearly articulates the responsibilities of industry as well as State and Local governments, but only requires Federal agencies to minimize potential adverse effects on the environment, considering practicable alternatives. It is essential that the Federal government be held accountable for meeting the same requirements as other pollution sources. (Page 34)

SUMMARY

The bills proposed address important environmental problems. We urge that they build on existing programs and accomplishments, placing priority on State implementation and integration of Federal activities. Legislation should be mindful of deficit problems. The nation does not need another "on the books" program building public expectations, which go unfunded because of deficit problems.

We appreciate the opportunity to comment on the legislation and look forward to working with the Committee in the future to protect marine resources. I would be pleased to answer any questions you might have at this time.

ASIWPCA
QUARTERLY
ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS

George Bush
The President-Elect and the Environment

The positions espoused by President-Elect George Bush during the campaign have shed considerable light on the new Administration's environmental philosophy. Some familiar themes are likely to be carried over from the Reagan Years, with no major shifts in policy direction.

Under the Bush Administration, the U.S. Environmental Protection Agency is expected to generally stay the course, but escalate the pace at which some national concerns are addressed. A most certain emphasis will be on more effective use of the private sector, innovation, and consensus building.

While Mr. Bush has said that he supports a strong implementation and program management role under the new Administration, which emphasizes Federal standards setting and research, his adamant opposition to new taxes may paint the USEPA and the States into a fiscal corner. This could continue the trend toward reduced Federal funding to States, most notably for nonpoint sources and the State Revolving Loan Fund under the Clean Water Act.

NEW THRUSTS—Stronger Executive leadership is expected on acid rain, ozone depletion, international policy and wetlands protection with bolder action to:

- reduce sulphur oxide and nitrogen oxide emissions—using some form of cost sharing and a balance between new technology and regulation,
- take a stronger international role in addressing acid rain, ozone depletion, and global warming, and
- limit the loss of wetlands.

STRONGER FOCUS—The Bush Administration will undoubtedly continue its emphasis on enforcement. Groundwater protection should receive more attention—with a limited Federal role, giving priority to pesticides management. Mr. Bush, however, continues to stress his sympathy and support for the farming community, so it is likely that the new Administration will expand the Department of Agriculture's role beyond existing legislation to support conservation and nonpoint source control.

According to Mr. Bush, he will expect USEPA to deliver on his campaign promises for faster Superfund cleanups, streamlined regulations for toxics, waste minimization, recycling, and protection of oceans. Increased natural resource development is also likely. The Administration is expected to continue the existing policy thrusts on surface water quality, stressing the phrase, "within available resources."

ON THE HILL—The Bush Administration is expected to be more active than Reagan in legislation development, particularly regarding:

- reauthorization of both the Clean Air Act and Resource Conservation and Recovery Act, and
- development of a national groundwater bill.

The role of the Office of Management and Budget in legislative development and decision making is

continued on page 6

ASIWPCA Fiscal Year 1989 Calendar of Events

1989

February 20-22
ASIWPCA Mid-Winter Meeting, Hall of the States Building, Washington, DC

February 26-28
National Governors' Association (NGA), Winter Meeting, Hyatt Regency, Washington, DC

April 23-26
NACD/ASIWPCA Co-Sponsored Conference on Nonpoint Sources, Clarion Hotel, St. Louis, Missouri

May 9-10
ASIWPCA Board of Directors Meeting, Hall of the States Building, Washington, DC

July 30-August 1
National Governors' Association (NGA), Annual Meeting, Chicago, Illinois

August 13-16
ASIWPCA Annual Conference, Sheraton Music City, Nashville, Tennessee

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FALL ASIWPCA 1988

ASIWPCA INTERVIEW WITH CONGRESSMAN EDWARD BOLAND

ASIWPCA: You are retiring from Congress after 36 years, half of which you spent as Chairman of the House HUD/Independent Agencies Subcommittee with control over USEPA's appropriations. That has given you one of the longest and broadest perspectives on environmental programs. Are you satisfied with our progress?

Boland: Well, as I reflect back, I am struck first by just how far we have come. When I came to Washington, there was no real environmental movement—only a wisp of a national environmental consciousness. Since the early 1970's, we have mobilized a lot of energy and resources, and environmental concerns are now a part of our national psyche. At the same time, though, the threats to the environment seem to loom as large as ever.

ASIWPCA: Does this mean that our environmental programs have been "shortchanged"?

Boland: Not necessarily. We have accomplished most of the original objectives in controlling air and water pollution. But, in 1970, I don't think anyone really appreciated the dimensions of the task at hand. Behind each problem was another problem, and behind most *solutions* were more problems. It wasn't as simple as just shutting down a few "polluters." "We have met the enemy and he is us." Pollution and environmental conflicts are an inevitable part of life.

ASIWPCA: The 1988 campaign gave the environment priority attention. What do you think that signifies?

Boland: It is no secret that the environment has not enjoyed a high priority under the Reagan Administration. The two campaigns recognized this issue as a "slumbering giant" and tried to tap this political energy.

ASIWPCA: Will this translate into more money and visibility for the environment in the new Administration?

Boland: Visibility, yes. Money, maybe. I cannot overemphasize the seriousness of the fiscal box we are in. Until we find a solution to the Federal deficit that's stuck at $150 billion, the President will have a tough time finding money to increase anything. And barring a significant shift in emphasis away from defense, increases for environmental programs must come at the expense of other domestic programs—education, housing, welfare, etc.

ASIWPCA: Does that include the space program?

Boland: Sure, all these programs must compete. I realize some people are jealous of the $1.8 billion increase that we gave NASA in 1989. But, this country needs a space program, and it was our judgement that to proceed at less than that level made no sense. Besides, NASA satellites and their other earth observation programs can make a great contribution to understanding environmental problems: upper atmospheric processes, ozone depletion, and global climate change.

ASIWPCA: Does that apply to the space station?

Boland: Let's save that one for another interview.

ASIWPCA: What do you consider your greatest environmental accomplishments?

Boland: Well, I think the Appropriations Committee has provided a lot of support to the environmental programs over the years and exerted a steadying influence on the entire process—basically, a common sense approach to ensure that the money we have is well spent.

ASIWPCA: For example?

Boland: Advanced Treatment (AT) reviews of construction grants projects is a good example. I realize it may not be a popular example with your members, but before we required the Administrator's approval for AT projects, many cities were, as a matter of course, building advanced treatment projects which provided only marginal benefits at great cost. These AT reviews saved over $800 million during the past 9 years. But more importantly, I think this brought about a change in mindset, and a realization that simply spending money on the environment is not enough. Each project must be cost effective and each dollar spent must produce maximum environmental benefit.

ASIWPCA: Your Committee has been a strong supporter of funding for the environment. Can we expect that to continue in the future?

Boland: Yes, historically we have been good to USEPA and to the States, and I see no reason why that wouldn't continue under Chairman Bob Traxler (D-Michigan). Over the years, we have added an average of more than $100 million a year above the President's request for USEPA's operating programs. I think the Appropriations Committee can take a lot of pride in those additions. We shored up some soft spots in the President's requests and we were out in front in responding to some serious issues: environmental workforce training, research on indoor air pollution, radon mitigation, LIMB research to start solving the acid rain problem, and pushing USEPA to improve its risk assessment tools, to mention a few.

ASIWPCA: Do you believe USEPA's budget priorities, as reflected in their final 1989 appropriation, provide a useful blueprint for the future?

Boland: I'd say our 1989 bill is a good departure point, with two caveats. First, attention in recent years has been focused to a great extent on environmental risks to *human health*. USEPA has succeeded in sharpening its analytical tools and control programs, especially with respect to cancer. But, I suspect it's time for the pendulum to swing back, with greater emphasis directed to *ecological* problems—wetlands, oceans, the food chain, the upper atmosphere, etc.

ASIWPCA: You mentioned a second caveat?

Boland: The time for Federal leadership in *pollution prevention* is long overdue. Obviously, wastes which are not generated can not become environmental problems. However, I simply can not accept the argument that "market forces" will lead firms to reduce their wastes substantially. We need to augment enforcement "ticket writing" with some practical technical assistance on how to streamline industrial processes to reduce waste generation. Many States are already well ahead of USEPA on this, and I hope the new Administration recognizes the potential for making pollution prevention a full-fledged mission for USEPA.

ASIWPCA: What has been your biggest disappointment in terms of environmental programs?

Boland: No question about it . . . the biggest disappointment has to be Superfund! We are spending almost as much on Superfund as on all of USEPA's operating programs (including State grants) combined. And, Superfund is providing only the smallest fraction of environmental benefits. We are *studying* Superfund sites, instead of cleaning them up. We are relying on Federal contractors to do most of the cleanups, rather than the responsible parties. And, worst of all, *the program seems to be rewarding the recalcitrants*, instead of those private parties who step forward and agree to do their own cleanups. The program is simply not working effectively, and there is more than enough blame to go around. There are just too many other pressing environmental problems for us to be spending $1.5 billion on Superfund, unless it begins to produce real results.

ASIWPCA: How do you view the roles and relationships between the Congress, USEPA and the States?

Boland: I think the Administrator of USEPA has the toughest job in Washington. The programs touch every element of society, with every decision requiring the juggling of all sorts of factors. The Administrator is buffeted by environmentalists, industry, the Hill, the States, the Cities, and the Office of Management and Budget (OMB). In addition, there are very ambitious goals which USEPA, the States and localities are left to meet—State Revolving Loan Funds (SRF), drinking water standards, Title III, and nonpoint source controls, to name a few. When the applause dies down after the authorization of some new piece of legislation, the Appropriations Committee is usually left scratching its head over where to find the money. Of course, USEPA, the States and cities are still expected to produce.

ASIWPCA: You are singing our song! The Clean Water Amendments gave States new responsibilities for SRFs, toxics, sludge, stormwater runoff, nonpoint sources, and the list goes on, but State grants keep shrinking to inflation. Are you aware of the States' growing unrest over the so-called "partnership?"

Boland: Absolutely. I have some real sympathy for the States and the job they face. In the final analysis, it is the States who must do the lion's share of permitting and enforcement to assure that our environmental programs succeed. Given the size of the task, the $300 million in Federal assistance provided for State grants (for air, water, drinking water, hazardous waste, etc.) is a modest amount, and a small fraction of the total effort carried out by State programs. Unfortunately, budget constraints have made it impossible to provide inflation increases for State grants, in the face of steadily expanding responsibilities.

ASIWPCA: What's the answer—is there a way out of this box?

Boland: I think our new President has to start with honest dialogue with the States. We need to make some conscious decisions that everyone buys into. We need to decide how to split up the responsibility for environmental issues and for funding those programs.

ASIWPCA: The States' recent experience with taking responsibility for wastewater treatment through the transition from Construction Grants to State Revolving Loan Funds has been painful—a host of administrative hassles with USEPA, the letter of credit fiasco, and then the 1989 funding cut from $2.4 billion to $1.9 billion.

Boland: It does sound like "a trail of broken promises." Most of the problems, I think, grow from the fact that President Reagan never supported the Clean Water legislation—it was enacted over his veto. So, the OMB and USEPA seem to

continued overleaf

BOLAND
continued from preceding page

busy themselves making things more difficult for the States. We knew from the start that 1989 would be an impossible year for appropriations because of the Budget Summit Agreement guidelines. The funding constraints were just extraordinary. We did manage to add $450 million above the President's request, but it was impossible to find enough money for the competing priorities.

ASIWPCA: What is your advice to the States for the 1990 budget deliberations?

Boland: *Sell your case!* I think the States must document exactly what impacts Federal funding reductions are having and will have on their water quality programs. In a way, your clean water successes coupled with the achievements of the 1988 municipal deadline make it difficult for States to communicate the real dimensions of their problems. It would also help if the mayors *really* went to work with you. The termination of HUD's Urban Development Action Grant (UDAG) program seemed to capture most of their attention last year.

ASIWPCA: What do you think it would take for environmental programs to win a significantly bigger piece of the pie?

Boland: The electorate, the public, has to assert themselves in substantial numbers to emphasize that the environment has an overriding priority. Not just in and of itself, but in the context of all the other things that citizens look to government for. The polls show that the environment has broad support, however, the past eight years suggest it may be broad but not too deep. Perhaps the 1988 campaign has galvanized the growing consciousness over ocean disposal, medical wastes, global warming, radon, etc. This could translate into more intense support for all our environmental programs. I suspect that the crisis in municipal landfills, lurking just around the corner, will really bring the reality home.

ASIWPCA: Mr. Chairman, we appreciate your contribution to the protection of our nation's environment and we thank you for your continuing graciousness to our organization. What are your plans for the future?

Boland: Thank you, Robbi. It has been my pleasure to work with the States and with ASIWPCA on these important programs. Now I am going home to enjoy my retirement, help my wife with the children—and have my basement checked for radon.

SYMPOSIUM

ASIWPCA SRF Symposium Sets Future Agenda

The ASIWPCA Symposium on State Revolving Loan Funds (SRFs) in Lake George, New York, June 7-9, 1988, provided the opportunity for States to make significant progress in the development of SRFs. More than 100 representatives from 42 States were joined by selected USEPA personnel. States shared their expertise and exchanged information on program structures, tax law, Federal policy, program marketing strategies, and financial management. The quality of the State presentations confirmed that substantial progress has been made since passage of the 1987 Water Quality Act. Even so, major challenges lie ahead.

PRINCIPLES—State and Local governments reached a covenant with Congress and the Administration in the 1987 Water Quality Act. In doing so, over $75 Billion in wastewater construction needs were transferred to State and Local governments. In exchange was an $18 billion, 9-year authorization, accompanied by the Congressional commitment to provide for an efficient transfer of program responsibilities. **All parties agreed to build a workable program, wholly State managed with minimal Federal requirements.** Symposium results indicate these basic tenets are in serious jeopardy, because of onerous Federal guidance and reduced funds.

COMPELLING NEED—The SRF program is at a critical juncture. States have the capability and commitment to establish this pioneering program, but to become viable, symposium participants agreed there is a compelling need to:

- ***Fully fund the SRF program at authorised levels,***
- ***Finish defining USEPA policy,***
- ***Give States flexibility,***
- ***Institute effective State SRF marketing strategies,***
- ***Eliminate or modify the USEPA Letter of Credit funding scheme, and***
- ***Promote affordable projects for small and hardship communities.***

While these issues go to the very heart of the SRF program, most States agreed that major surgery is not required. The refinements can be achieved by clarifying State/USEPA roles and responsibilities. Further, it was agreed that State water quality managers must take a leadership role at home to assure success, since the SRF is first and foremost an *environmental* program.

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The 100th Congress at a Glance

The 100th Congress adjourned with a number of accomplishments in the environmental arena, most notably passage of the Clean Water Act over two Presidential vetos. Due to the high rate of return for incumbents, Congressional members may want to take up where they left off. The following actions were taken, generally as amendments to existing law.

FUNDING—For the first time in 12 years, all 13 appropriations bills cleared Congress before the beginning of the fiscal year. For the Clean Water Act, $1.88 Billion was provided for financing municipal wastewater treatment and $67.1 Million for Section 106 State management assistance. No funding was appropriated for Section 319 nonpoint source management. (PL 100-404)

CLEAN WATER—In one of its first actions, the 100th Congress reauthorized the Clean Water Act at $20 Billion with new programs to capitalize State Revolving Loan Funds, manage nonpoint sources, permit toxic discharges, and regulate stormwater. (PL 100-4)

TAX—Amendments to the 1986 Tax Reform Law also passed. For blind pool bond issues such as the State Revolving Loan Fund, issuers must generally commit 95% of the loan proceeds within 3 years. (H. Rept. 100-1104)

FIFRA—FIFRA was reauthorized with provisions on pesticide registration, testing, and fees. (PL 100-532)

OCEANS—The Marine Protection, Research and Sanctuaries Act was reauthorized to increase site designations and strengthen enforcement. (PL 100-627)

The Marine Mammal Protection Act was reauthorized, with further protection of marine animals such as dolphins from commercial fishing. (H.R. 4139)

Ocean dumping of sewage sludge and industrial waste is prohibited after 1991. (H. Rept. 100-1090)

"6-pack" plastic rings must be biodegradable. (PL 100-555)

USEPA must set requirements for disposal of medical waste. (PL 100-582)

Use of tin-based marine anti-foulant chemicals on some vessels is prohibited. (PL 100-333)

DRINKING WATER—Lead-lined water coolers in schools must be eliminated within 15 months. States must provide substantial assistance in achieving this objective with $90 Million allowed for State grants. (PL 100-572)

ASBESTOS—The Federal deadline for inspection of asbestos in schools was extended with streamlined cost recovery from manufacturers. (PL 100-337)

RADON—The national USEPA radon program was enacted. (PL 100-551)

ENDANGERED SPECIES—The Endangered Species Act was reauthorized with new authority for State matching grants. (PL 100-478)

WATER RESOURCES—$2 Billion in flood control and other water projects were authorized for the Corps of Engineers, consistent with cost-share principles established in 1986. (H. Rept. 100-1098)

GROUNDWATER—Efforts to enact groundwater legislation failed on two fronts:

- provisions on groundwater protection were stripped from the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) amendments enacted (see above), and
- House and Senate conferees could not reach agreement on a research bill (H.R. 791) before adjournment.

ACID RAIN—Consensus reached in the Senate between coal producing and environmentally impacted States died for lack of support in the House and from environmental groups.

New Congress

The new Congress will have its plate full. Major issues include reauthorization of the Clean Air Act and the Resource Conservation and Recovery Act as well as development of legislation for groundwater protection, global warming, and marine research.

Oversight on the 1987 Water Quality Act, particularly in the areas of nonpoint sources, toxics, and wastewater treatment financing for small communities, is also likely. The active role expected from the Bush Administration could expedite consensus. However, as in previous years, action may be delayed if Congress becomes preoccupied with budget issues early in the session.

ASIWPCA's Project 1992

ASIWPCA's Project 1992 is a commemoration of the twentieth anniversary of the Clean Water Act. The principle components of the Project include grassroots activities, youth education, technical exchange, trends analysis, and a national celebration.

The month of February will kick off the first Steering Committee meeting, as well as the initial meeting of the Workgroup for the Trends Analysis component of Project 1992.

The ASIWPCA continues to conduct briefings for organizations interested in contributing to this grand effort, and welcomes financial contributions and volunteer assistance. Contact Robbi Savage at (202) 624-7782.

BUSH *(continued from page 1)*

expected to be made more clear once a Director has been formally named.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), passed in the closing hours of the 100th Congress, is not likely to receive much Presidential attention related to expanding the Act to address pesticides in groundwater.

A strong position opposing new taxes may indicate a very austere FY 1990 Budget for domestic programs (including the environment).

Because USEPA is not a cabinet post, it may be mid-Spring before the Agency leadership is in place. In the interim, USEPA is attempting to lay a foundation for the establishment and continuation of various programs (e.g., wetlands, groundwater, nonpoint sources, etc.). To address these complex issues, the new Administration is likely to reorient existing programs and rely on the States to take the lead in many of the emerging areas. ◆

RECOMMENDED PUBLICATIONS

U.S. Environmental Protection Agency—Protecting Human Health and the Environment Through Improved Management; GAO, August 1988.

Environmental Progress and Challenges; USEPA's Update, August 1988.

Future Risk: Research Strategies for the 1990s; USEPA's Science Advisory Board, September 1988.

Municipal Sector Study: Impacts of Environmental Regulations on Municipalities; USEPA, September 1988.

Agricultural Sector Study: Impacts of Environmental Regulations on Agriculture; USEPA, September 1988.

Small Business Sector Study: Impacts of Environmental Regulations on Small Business; USEPA, September 1988.

NOTE: All USEPA documents are available from the USEPA Press Office.

The Transition: Setting State Priorities

ASIWPCA is working with the National Governors' Association (NGA), The Association of State and Territorial Solid Waste Management Officials (ASTSWMO), and the State and Territorial Air Pollution Program Administrators (STAPPA), developing the States' environmental agenda presented at the December meeting of the NGA Executive Committee and President-elect Bush.

In addition, members of the State/USEPA Operations Committee met in December to discuss State priority issues with members of the Transition-Team.

Key issues of State concern include:

- Successful implementation of the Clean Water Act, with particular attention on the State Revolving Loan Fund and Nonpoint Source Control programs.
- Continued USEPA technical and funding assistance to States for implementation and enhancement of State groundwater protection programs.
- Passage of a Clean Air Act which appropriately addresses air toxics, acid rain, and non-attainment.
- Reauthorization of the Resource Conservation and Recovery Act, to include clarification of State/USEPA roles and responsibilities in solid waste management.
- Increased emphasis on source reduction and pollution prevention in all environmental programs.

SYMPOSIUM
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APPROACH—Symposium participants reiterated the fact that there is *no* magic or consistent formula for SRF implementation. To be successful, States will need to utilize a cadre of innovative program techniques which will dictate maximum Federal and State flexibility. Symposium participants concluded that States should:

- Keep the approach simple,
- Maintain water quality goals and priorities as the driving force,
- Focus on the requirements of the law, and
- Do homework thoroughly before negotiations.

FUNDING—Meeting over $75 billion in needs with less than $8.4 billion for SRF capitalizations will be a formidable challenge. States voiced concern over future funding, emphasizing that whatever resources are provided will be significantly eroded by the USEPA Letter of Credit (LOC), which restricts cash payment of capitalization funds to States. Federal tax law and Title II grant requirements will, according to the States:

- Reduce the number of funded environmental projects and
- Limit SRF uses authorized under the Act (i.e. interest earnings, leveraging, and refinancing).

States agreed that if the LOC cannot be eliminated, it should be modified to allow flexible payment schedules and cash draws in anticipation of expenses.

FEDERAL REQUIREMENTS—There is concern that many USEPA policies have not, in some critical instances, been fully defined. States called upon the USEPA to provide:

- A clear, simple policy on NEPA,
- A workable approach to compliance with cross-cutting Federal laws (e.g. the Historic Preservation Act),
- Clarification on the need for formal State Attorney General certification, and
- Further clarification as to application of:

—USEPA National Municipal Policy,
—Minority and Women Business Enterprise requirements (MBE/WBE), and
—Title II grant requirements.

NEW FRONTIERS—Federal involvement in the SRF is not limited to USEPA—the Federal tax law has clearly demonstrated the impacts that municipal bonding restrictions can have on the SRF program.

The 1986 Tax Act fundamentally affects day-to-day SRF management. The highly complex and prescriptive requirements on arbitrage, rebate, private purpose use, and tax exempt bonding will require careful planning and scrupulous record keeping.

In addition, because the SRF must be competitive in the financial world, well thought out loan marketing strategies will be critical to the program's short and long term viability. State incentives for local participation include attractive interest rates, SRF "one stop shopping," technical assistance, program stability, flexible eligibilities, and, of course, enforcement.

MANAGEMENT—The cumulative effect of the environmental, tax, reporting, and management requirements will result in complex and expensive SRF programs. Sound legal and financial expertise is absolutely essential. However, SRF managers anticipate only modest staff increases, as States intend to supplement resources with existing personnel under interagency arrangements (e.g. for tax counsel). In addition, States are convinced that the 4% allotment of capitalization grants in the 1987 Water Quality Act for administrative costs will *not* be adequate unless legislative relief is provided.

To address these critical issues, ASIWPCA has established a Technical Amendments Subcommittee to examine the potential and desirability of legislative changes to the statute. In addition, there will be a continuing series of ASIWPCA technical exchange sessions on this subject. ◘

State Revolving Loan Funds and Tax Law

Historically, tax law was the jurisdiction of the "green eye shade" crowd—something that environmental professionals read about in the morning newspaper. Today, financing for public purposes, such as environmental protection, is under attack, along with tax exemption for State and local government bonds.

The 1986 Tax Act changed State and Local financing dramatically. Congress declared open season, treating State and Local governments like every other "drain" on the U.S. Treasury. This shift in position creates an uneven playing field for State and Local entities which do not vote or contribute to political campaigns. In addition, the 1986 Federal tax law has major impacts on State Revolving Loan Funds (SRF) authorized under the Clean Water Act of 1987. By the best estimates, we anticipate that:

- paper work will substantially increase,
- the public will pay more for services, with no added environmental protection, and
- SRF uses envisioned under the 1987 Water Quality Act will be significantly curtailed.

SRF Impact—Over the last decade, funding for environmental programs remained relatively constant, with States supplementing State and Federal resources with tax exempt bonds. At fully authorized levels ($2.4 billion), State analysis indicates that by the year 2007, SRF funds will *just begin* to outpace inflation and buy down the $33 billion in existing needs for sewage treatment and interceptors. This buying power will be significantly eroded under the 1986 Tax Act because it:

- eliminates the opportunity for State and Local governments to use arbitrage funds earned from bond proceeds *and* loan repayments,
- makes States accountable for loan recipients (e.g., one local mistake on arbitrage can cause State bonds to lose their tax exempt status),
- limits use of bond proceeds for the private sector (e.g., sewage treatment for a Federal facility, leased

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USEPA Looks at State and Local Funding Needs

Because of the concerns of State and Local governments over the increase in requirements and implementation costs for programs at a time of waning or eliminated Federal funding, the USEPA has initiated projects to assess State and Local funding needs.

The USEPA Office of Water has drafted "Paying for Cleaner Water: The State Funding Study," to examine State funding needs for the implementation of wastewater and drinking water programs. The USEPA Office of Policy Analysis has also initiated a study which will focus on the impact of environmental requirements on municipal, small business, and agricultural activities. Other offices are exploring public-private partnerships as a means of financing environmental efforts.

USEPA Regional meetings and workshops on alternative financing are scheduled for next year to address these issues of concern.

In addition, ASIWPCA and USEPA co-sponsored a conference on Municipal Financing and Construction, November 15-17, 1988 in St. Louis, to focus on implementation of the State Revolving Loan Fund Program.

Association of State and Interstate
Water Pollution Control Administrators
Hall of the States
444 North Capitol Street, NW (Suite 330)
Washington, DC 20001

SRF & TAX LAW

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cafeteria space, or loans to farmers), and

- limits the amount of proceeds (10%) which can be used for a reserve fund (debt service or leveraging).

As a result, fewer environmental projects will be built, due to lost earnings and complex administration. To preserve bond ratings and minimize cost, States need to closely examine this law and structure their SRFs very carefully. In most instances, State water administrators are relying on their treasurer's and comptroller's offices for expert council and assistance. And, as the issues become more complex, these institutions are becoming fluent in the new environmental and tax program lexicons.

Legislative Action—In April 1988, the Supreme Court (see related story) stripped away the constitutional protection States once enjoyed for tax exempt bonds. Regrettably, an abuse, real or perceived, by one or more towns can lead to sweeping Congressional limitations on legitimate State and Local bond issues. Current proposals in the 1988 House Tax Corrections Act (H.R. 4333) and other bills continue the current trend: setting 3 year deadlines for loan origination, requiring up front loan commitments, prohibiting revolving funds, limiting issuance costs, and increasing both borrowing costs and interest rates.

Congress is beginning to hear the concerns of State and Local officials. For example, a new bill, H.R. 3807, raises the small issue exemption from arbitrage/rebate restrictions to $25 Million—providing relief for 80% of State and local issues. S.R. 463 supports a constitutional amendment to protect State and local bonds from Federal taxation.

The Bottom Line—Federal tax law has the potential to become a major roadblock to successful implementation of State Revolving Loan Funds. The best advice to date is to keep the program simple. The stakes are high and the issues are challenging. At the recent ASIWPCA SRF Symposium, Benson Cohn, Assistant Treasurer of Connecticut, offered States some sage advice:

- State and Local governments should not expect equity or fairness,
- Expect no accommodations for the fact that USEPA and tax law requirements are inconsistent,
- Work closely with the State treasurer, controller, or bond authority, and
- If your State has a funding source, other than bonds—cherish it.

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TESTIMONY

OF

EDWARD O. SULLIVAN

DEPUTY COMMISSIONER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

BEFORE THE

HOUSE SUBCOMMITTEE ON WATER RESOURCES

PUBLIC WORKS AND TRANSPORTATION COMMITTEE

APRIL 4, 1990

MR. CHAIRMAN, I APPRECIATE THE OPPORTUNITY TO APPEAR BEFORE THIS SUBCOMMITTEE TODAY TO DISCUSS THE FEDERAL CLEAN WATER PROGRAM. I AM SUBMITTING THIS TESTIMONY FOR THE RECORD, BUT WILL COVER ONLY SOME OF THE MORE IMPORTANT HIGHLIGHTS IN MY ORAL STATEMENT. THE MAJOR AREAS I WANT TO COVER ARE:

1. FEDERAL PROGRAM FUNDING;
2. STATE WATER POLLUTION CONTROL REVOLVING FUND IMPLEMENTATION;
3. COMBINED SEWER OVERFLOWS; AND
4. EFFLUENT WATER QUALITY AND STANDARDS

MR. CHAIRMAN, I APPEAR TODAY WEARING TWO HATS. I AM THE DEPUTY COMMISSIONER FOR ENVIRONMENTAL REMEDIATION OF THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION - THE AGENCY WITHIN NEW YORK STATE CHARGED WITH WATER POLLUTION CONTROL REGULATORY AND MUNICIPAL ASSISTANCE RESPONSIBILITIES. AT THE SAME TIME, I AM COMMISSIONER JORLING'S DESIGNATED CHAIR FOR THE GOVERNING BOARD OF THE NEW YORK STATE ENVIRONMENTAL FACILITIES CORPORATION - THE PUBLIC BENEFIT CORPORATION THAT HAS CUSTODY OF THE NEW YORK STATE WATER POLLUTION CONTROL REVOLVING FUND (COMMONLY KNOWN AS THE SRF).

I HAVE GOOD NEWS. ON MARCH 27, 1990, THE USEPA APPROVED THE LARGEST SINGLE GRANT ACTION IN ITS HISTORY WHEN IT AWARDED NEW YORK STATE ITS INITIAL SRF CAPITALIZATION GRANT OF $212 MILLION PURSUANT TO TITLE VI OF THE FEDERAL WATER QUALITY ACT OF 1987.

BY YEAR'S END, WE WILL MAKE MORE THAN $600 MILLION IN LOW INTEREST RATE LOANS TO MUNICIPALITIES TO BUILD WATER POLLUTION CONTROL FACILITIES. OUR FIRST SRF LOAN TO BE MADE NEXT MONTH WILL BE THE LARGEST IN THE TITLE VI PROGRAM TO DATE - $170 MILLION.

PROGRAM FUNDING

MR. CHAIRMAN, I REALIZE THAT THIS SUBCOMMITTEE DEALS WITH THE AUTHORIZED LEVELS RATHER THAN ACTUAL APPROPRIATIONS TO CARRY OUT THE PURPOSES OF THE CLEAN WATER ACT. NEVERTHELESS, PLEASE USE YOUR INFLUENCE TO HELP RESTORE THE SHORTFALLS IN FEDERAL FUNDING WHICH WE HAVE EXPERIENCED IN RECENT YEARS.

RESOURCES FOR PROGRAM ADMINISTRATION

LACK OF ADEQUATE RESOURCES TO CARRY OUT WATER QUALITY PROGRAMS NOT ONLY AFFECTS THE ABILITY OF LOCAL GOVERNMENTS TO CONSTRUCT NEEDED TREATMENT WORKS, BUT ALSO IMPACTS THE ABILITY OF THE STATE TO PERFORM ITS ROLE. EXISTING PROGRAMS AUTHORIZED BY THE CLEAN WATER ACT SHOULD BE FULLY FUNDED. WHEN CONGRESS AUTHORIZES NEW PROGRAMS BUT THEN FAILS TO FULLY FUND THESE ACTIVITIES, OUR CREDIBILITY WITH THE PUBLIC AND REGULATED COMMUNITY IS ERODED.

FOR EXAMPLE, SECTION 319 OF THE CLEAN WATER ACT ESTABLISHES A NATIONWIDE NONPOINT SOURCE (NPS) MANAGEMENT PROGRAM. IN NYS, NPS's CONTRIBUTE TO 80% OF WATER QUALITY PROBLEMS. THE ACT

AUTHORIZED AN APPROPRIATION OF $400 MILLION OVER THE FOUR YEAR PERIOD ENDING IN FEDERAL FISCAL 1991. TO DATE ONLY $40 MILLION HAS BEEN APPROPRIATED. THE PRESIDENT'S BUDGET PROPOSES ONLY $14 MILLION FOR FISCAL 1991. THIS PROGRAM NEEDS TO BE REAUTHORIZED AND FUNDING SHOULD BE PROVIDED AT THE $130 MILLION LEVEL WHICH WAS AUTHORIZED FOR 1991.

FUNDING FOR SECTION 106 (BASIC WATER QUALITY PROGRAM ADMINISTRATION) MUST BE INCREASED TO MAKE UP FOR THE TERMINATION OF THE CONSTRUCTION GRANTS SETASIDES OF 205(J)(1) AND 205(J)(5). THE ASSOCIATION OF STATE AND INTERSTATE WATER POLLUTION CONTROL ADMINISTRATORS (ASIWPCA) ESTIMATES THAT $600 MILLION IS NECESSARY NATIONALLY EACH YEAR TO CARRY OUT EXISTING PROGRAMS. THE CURRENT 106 AUTHORIZATION WOULD HAVE TO BE DOUBLED TO EVEN MAINTAIN A 25% FEDERAL FAIR SHARE. ADDITIONAL FUNDS ARE NECESSARY SO THE STATES CAN ASSUME DELEGATION OF THE PRETREATMENT PROGRAM AND ADMINISTER FEDERALLY MANDATED STORMWATER PERMITS.

SECTION 320 WHICH ESTABLISHES THE NATURAL ESTUARY PROGRAM SHOULD BE REAUTHORIZED AND ITS FUNDING LEVEL SHOULD BE INCREASED TO $24 MILLION. THIS WILL HELP ENSURE COMPLETION OF COMPREHENSIVE CONSERVATION AND MANAGEMENT PLANS FOR ONGOING ESTUARY PROGRAMS SUCH AS THE NEW YORK/NEW JERSEY HARBOR ESTUARY PROGRAM AND WILL HELP INITIATE NEW PROGRAMS FOR OTHER ESTUARIES SUCH AS THE PECONIC.

THE FEDERAL CLEAN LAKES PROGRAM ESTABLISHED UNDER SECTION 314 SHOULD ALSO BE REAUTHORIZED AND FUNDING TO CLEAN UP OUR VALUABLE FRESHWATER RESOURCES SHOULD BE INCREASED.

TITLE VI RESOURCES

CONGRESS ESTABLISHED 1990 AS THE LAST YEAR FOR THE TITLE II CONSTRUCTION GRANTS PROGRAM, CREATED THE SRF PROGRAM TO TAKE ITS PLACE AND AUTHORIZED APPROPRIATIONS OF $8.4 BILLION FOR CAPITALIZATION GRANTS TO THE STATES WHICH ESTABLISHED SRF'S. THIS FIGURE WAS GENERALLY RECOGNIZED AS INADEQUATE. NEVERTHELESS, THE STATES WERE WILLING TO ACCEPT IT. APPROPRIATIONS, IN EACH OF THE FIRST TWO YEARS (1989 AND 1990), HAVE BEEN 20% SHORT OF THE AUTHORIZED LEVEL. THIS HARDSHIP COULD BE AT LEAST PARTIALLY RECTIFIED IF THE AUTHORIZED LEVELS FOR 1992, 1993, AND 1994 WERE INCREASED TO ACCOUNT FOR THE CUTS EXPERIENCED IN 1989 AND 1990 (AND POTENTIALLY IN 1991).

THE ALLOCATION FORMULA

THE FORMULA FOR ALLOCATING TITLE VI MONEY AMONG THE STATES SHOULD REMAIN "AS IS" FOR THE FINAL FOUR YEARS OF THE PROGRAM. STATES HAVE BASED THEIR PLANNING ON A CONTINUATION OF THE CURRENT ALLOCATION FORMULA AND ANY CHANGE AT THIS POINT WOULD DISRUPT THOSE PLANS.

TITLE VI IMPLEMENTATION

NEXT, I WANT TO DISCUSS WITH YOU SOME OF THE OBSTACLES CREATED BY TITLE VI TO KEEP STATE AND LOCAL GOVERNMENTS FROM TAKING FULL ADVANTAGE OF THE PROGRAM. THESE REQUIREMENTS THREATEN TO SUBSTANTIALLY INCREASE COSTS TO LOCAL GOVERNMENTS AND MAY CAUSE MANY OF THEM TO LOOK ELSEWHERE FOR THEIR FINANCING. THEY ARE:

1. CASH DRAW LIMITATIONS
2. RESTRICTIONS ON ADMINISTRATIVE COSTS
3. THE ALLOWABLE LOAN AMORTIZATION PERIOD
4. ELIGIBILITY OF LANDS AND RIGHTS-OF-WAY
5. USEPA OVERSIGHT REQUIREMENTS
6. TITLE II REQUIREMENTS
7. "CROSS-CUTTING" REQUIREMENTS

1. CASH DRAW LIMITATIONS

WHEN CONGRESS PASSED THE WATER QUALITY ACT IN 1987, IT INTENDED THAT ALL STATES WOULD RECEIVE EIGHT QUARTERLY CASH DISBURSEMENTS OF THEIR GRANT AWARDS TO CAPITALIZE REVOLVING LOAN FUNDS. HOWEVER, IN IMPLEMENTING THE PROGRAM, THE FEDERAL OFFICE OF MANAGEMENT AND BUDGET (OMB) AND THE USEPA DETERMINED THAT "PAYMENTS" WOULD BE MADE IN THE FORM OF LETTERS OF CREDIT RATHER THAN CASH. EACH STATE IS NOW REQUIRED TO DRAW CASH FROM ITS INDIVIDUAL LETTER OF CREDIT AS TITLE VI PROGRAM COSTS ARE INCURRED. FORTUNATELY (FOR NEW YORK STATE), THE USEPA HAS

APPROVED OUR PROGRAM FOR THE "AGGRESSIVE LEVERAGING" METHOD OF CASH DRAWS. THE "AGGRESSIVE LEVERAGING" METHOD OF CASH DRAWS COMES THE CLOSEST TO THE ORIGINAL INTENT OF CONGRESS. ALTHOUGH WE APPRECIATE THE ASSISTANCE AND UNDERSTANDING OF USEPA STAFF, GAINING APPROVAL OF THE ACCELERATED CASH DRAW WAS AN UNCERTAIN AND LABORIOUS PROCESS WHICH MUST BE REPEATED EACH YEAR FOR EACH CAPITALIZATION GRANT. FURTHERMORE, ONLY ONE OTHER STATE (MINNESOTA), ASIDE FROM NEW YORK, HAS RECEIVED USEPA APPROVAL FOR THE AGGRESSIVE LEVERAGING METHOD OF CASH DISBURSEMENTS. TO SOLVE THIS PROBLEM, CONGRESS SHOULD DIRECT OMB AND EPA TO PAY THE GRANT AMOUNT IN CASH.

2. RESTRICTIONS ON ADMINISTRATIVE COSTS

ONE OF THE MOST SERIOUS BURDENS ON NEW YORK'S SRF PROGRAM IS FOUND IN SECTION 603(D)(7) OF THE ACT WHICH RESTRICTS THE USE OF MONEYS IN THE SRF OR EARNINGS ON THE MONEYS IN THE SRF FOR SRF ADMINISTRATIVE PURPOSES TO "4% OF ALL GRANT AWARDS." THIS MEANS THAT THE 4% LIMITATION ON ADMINISTRATIVE COSTS APPLIES TO THE AMOUNT OF THE FEDERAL GRANT AND NOT TO THE AMOUNT OF LOANS MADE BY THE SRF. NEW YORK STATE IS FIRMLY COMMITTED TO A SELF-SUSTAINING, PERPETUAL FUND. OUR LEVERAGING PROGRAM WILL FINANCE THREE TIMES AS MANY PROJECTS AS A SIMPLE DOLLAR IN, DOLLAR OUT PROGRAM. WE CANNOT ACCEPT THIS 4% RESTRICTION. OUR ONLY ALTERNATIVE IS TO CHARGE SUBSTANTIAL FEES TO MUNICIPAL BORROWERS FOR OUR LOANS (FOR EXAMPLE NEW YORK CITY WILL BE CHARGED $2.2 MILLION FOR THEIR FIRST LOAN TRANSACTION). THESE FEES, COMPOUNDED BY OTHER PROGRAM REQUIREMENTS, DISCOURAGE MUNICIPAL PARTICIPATION IN THIS OTHERWISE EXCITING AND INNOVATIVE PROGRAM. IF THERE MUST BE A 4% RESTRICTION ON THE USE OF SRF RESOURCES FOR ADMINISTRATIVE COSTS, IT SHOULD BE BASED ON THE TOTAL AMOUNT OF FINANCIAL ASSISTANCE PROVIDED BY THE SRF. IN NEW YORK STATE, THE COST AND NUMBER OF PROJECTS AND, HENCE, THE WORKLOAD AND STAFF RESOURCES NECESSARY TO ADMINISTER THE PROGRAM WOULD BE A MULTIPLE (3.6) OF THE AMOUNT OF THE FEDERAL GRANTS THAT ARE PROVIDED. PLEASE NOTE THAT THIS PROVISION HAS NO IMPACT ON FEDERAL REVENUES. IT IS AN INTERNAL FUND MANAGEMENT ISSUE ON WHICH THE STATE SHOULD HAVE ADDITIONAL DISCRETION.

3. LOAN AMORTIZATION PERIOD

SECTION 603(D)(1) OF THE ACT REQUIRES THAT ALL SRF LOANS BE FULLY AMORTIZED WITHIN 20 YEARS OF PROJECT COMPLETION. IN TODAY'S BOND MARKET, MUNICIPALITIES FINANCE PROJECTS WITH 30 YEAR BONDS. SOME COMMUNITIES THAT QUALIFY FOR FMHA LOANS CAN AMORTIZE OVER A PERIOD OF UP TO 38 YEARS. FOR THE MOST PART, LOCAL OFFICIALS CONSIDER NOT THE TOTAL COST SAVINGS OF FINANCING THROUGH THE SRF, BUT THE IMPACT ON LOCAL SEWER BILLS DURING THE FEW YEARS OF THEIR EXPECTED TENURE IN OFFICE. EVEN WITH THE SUBSIDY PROVIDED BY NEW YORK'S SRF PROGRAM, THE ANNUAL COST OF A 20 YEAR LOAN FROM OUR SRF WILL BE JUST SLIGHTLY LESS THAN THE ANNUAL COST OF FINANCING WITH 30 YEAR BONDS. THE NECESSITY OF CHARGING A LOAN INITIATION FEE AND AN ANNUAL CHARGE TO SRF BORROWERS TO COMPENSATE FOR THE LIMITATION ON ADMINISTRATIVE

EXPENSES (DISCUSSED ABOVE) COMPOUNDED BY THE COSTS AND TIME DELAYS ASSOCIATED WITH MEETING TITLE II AND CROSS-CUTTING REQUIREMENTS (DISCUSSED BELOW), FURTHER NARROWS THE COST ADVANTAGE. SOME NEW YORK MUNICIPALITIES HAVE ALREADY OPTED OUT OF THE SRF PROGRAM. THE AVAILABILITY OF 30 YEAR PROJECT FINANCING INSTEAD OF 20 YEARS WOULD MAKE THE SRF PROGRAM MORE ATTRACTIVE, ESPECIALLY FOR THE SMALLER COMMUNITIES WHICH CRITICALLY NEED FINANCIAL ASSISTANCE. IF THE LOAN TERM IS INCREASED TO 30 YEARS, THE NUMBER OF PROJECTS FINANCED WOULD NOT BE SUBSTANTIALLY REDUCED AND THE PERPETUAL "REVOLVING" NATURE OF THE FUND WOULD NOT BE COMPROMISED.

4. LANDS AND RIGHTS-OF-WAY

THE TITLE II CONSTRUCTION GRANTS PROGRAM ONLY FUNDED PROJECTS DEFINED BY SECTION 212 OF THE ACT. CONGRESS PROPERLY EXPANDED THE LIST OF ELIGIBLE PROJECTS FOR THE TITLE VI PROGRAM. THE CHANGE ALLOWS STATES TO OFFER "ONE-STOP SHOPPING" FOR FINANCING WATER POLLUTION CONTROL PROJECTS, WITH ONE NOTABLE EXCEPTION. BECAUSE SECTION 603(C) INCORPORATES SECTION 212 OF THE ACT BY REFERENCE AND BECAUSE SECTION 212 INCLUDES ONLY CERTAIN LAND AS AN ELIGIBLE PROJECT COST, EPA HAS DETERMINED THAT ALL OTHER LAND COSTS ARE INELIGIBLE FOR SRF ASSISTANCE. THIS MEANS THAT MUNICIPALITIES ARE FORCED TO EXCLUDE THE COST OF LANDS AND RIGHTS-OF-WAY (OFTEN A SIGNIFICANT PART OF THE TOTAL PROJECT COST) FROM THEIR SRF LOAN APPLICATION. THEY MUST FIND OTHER

SOURCES OF FINANCING FOR THOSE COSTS. THIS SUBSTANTIALLY REDUCES THE ATTRACTIVENESS AND EFFECTIVENESS OF THE TITLE VI PROGRAM.

5. USEPA OVERSIGHT

SECTION 606 OF THE ACT ESTABLISHES REQUIREMENTS FOR FEDERAL OVERSIGHT AND REVIEW OF STATE SRF PROGRAMS. ALTHOUGH CONGRESS SET THE FINAL DATE FOR TITLE VI GRANTS AS 1994, THE ACT DOES NOT PLACE ANY LIMITATION ON THE FEDERAL OVERSIGHT, REPORTING, AUDITING AND RELATED ACTIVITIES. THESE PLACE AN ADDITIONAL BURDEN ON STATE PROGRAM ADMINISTRATION AND CONSUME STAFF RESOURCES. WE BELIEVE THAT, LOGICALLY, DIRECT USEPA INVOLVEMENT IN STATE PROGRAM ACTIVITIES SHOULD HAVE A SUNSET RELATED TO THE END OF FEDERAL FINANCIAL CONTRIBUTIONS TO STATE REVOLVING FUNDS. THE STATES WILL STILL BE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF STATE AND FEDERAL LAW GOVERNING THE ACTIVITIES AND USES OF EACH SRF.

6. TITLE II REQUIREMENTS

THE CONSTRUCTION GRANTS PROGRAM IS NOTORIOUS FOR ITS COMPLEXITY. MOST MUNICIPAL OFFICIALS WANT ASSURANCES THAT THEIR ADVERSE EXPERIENCES WITH THE CONSTRUCTION GRANTS PROGRAM WILL NOT BE REPEATED IN THE LOAN PROGRAM. MANY STAFF HOURS HAVE BEEN SPENT DISCUSSING THIS SUBJECT WITH LOCAL OFFICIALS. WITHOUT ASSURANCE THAT THE LOAN PROGRAM WILL BE SUBSTANTIALLY LESS COMPLICATED THAN THE GRANT PROGRAM, MANY MUNICIPALITIES ARE ADOPTING A "WAIT AND SEE" POSTURE. WHILE THE 16 TITLE II

REQUIREMENTS IN SECTION 602(B)(6) ARE THERE FOR LAUDABLE PURPOSES, IN COMBINATION, THEY ARE ONEROUS AND GENERALLY NOT APPROPRIATE FOR LOAN RECIPIENTS. THE LIST OF REQUIREMENTS SHOULD BE REVIEWED AND REDUCED TO RECOGNIZE THAT A LOAN PROGRAM IS VERY MUCH DIFFERENT FROM A GRANT PROGRAM.

7. CROSS-CUTTING REQUIREMENTS

USEPA HAS INTERPRETED SECTION 602(B)(6) TO MEAN THAT CONGRESS INTENDED SRF LOANS TO HAVE A FEDERAL CHARACTER. CONSEQUENTLY, EPA HAS RULED THAT 23 OTHER REQUIREMENTS (MANY OF WHICH ARE GEARED TO ISSUES OTHER THAN ENVIRONMENTAL PROTECTION) IN ADDITION TO THE 16 CITED IN SECTION 602(B)(6), APPLY TO THOSE SAME PROJECTS. IF THIS IS NOT THE INTENT OF CONGRESS, EPA NEEDS A CLEAR SIGNAL, PROBABLY IN THE FORM OF A LEGISLATIVE AMENDMENT. OTHERWISE, WE WILL CONTINUE TO FIND LOCAL GOVERNMENTS UNWILLING OR UNABLE TO EXPEND THE CONSIDERABLE AMOUNTS OF TIME AND MONEY NECESSARY TO COMPLY WITH THESE COMPLICATED REQUIREMENTS.

I WOULD NOW LIKE TO COMMENT ON COMBINED SEWER OVERFLOWS (CSO's), A TIMELY TOPIC GIVEN CONGRESSIONAL REACTION TO EPA'S NEW STRATEGY.

COMBINED SEWER OVERFLOWS (CSO's)

NYS BELIEVES THAT EPA'S CSO STRATEGY REPRESENTS A REASONABLE APPROACH TO ADDRESS POLLUTION FROM CSO's. NEW YORK HAS BEEN ADDRESSING CSO's POLLUTION SINCE THE 1960's. OUR STATE POLICY

FOR DEALING WITH THIS PROBLEM FOCUSES ATTENTION ON ELIMINATION OF DRY WEATHER OVERFLOWS AND THE CONTROL OF SOLID AND FLOATABLE MATERIALS IN CSO DISCHARGES AND IS CONSISTENT WITH EPA'S STRATEGY. WE, THEREFORE, FULLY ENDORSE AND SUPPORT EPA'S STRATEGY.

CSO's HAVE BEEN IDENTIFIED AS A MAJOR CAUSE OF WATER QUALITY PROBLEMS IN A NUMBER OF MAJOR METROPOLITAN AREAS OF NEW YORK STATE. IN THE NEW YORK/NEW JERSEY HARBOR AREA, CSO's HAVE BEEN IDENTIFIED AS THE MAJOR SOURCE OF FLOATABLE MATERIAL WHICH CONTRIBUTED TO BEACH CLOSURES DURING THE SUMMER OF 1988.

THE STATE HAS REQUIRED NEW YORK CITY TO DEVELOP A CITY-WIDE PROGRAM FOR THE ABATEMENT OF CSO's CAUSING CONTRAVENTIONS OF WATER QUALITY STANDARDS. IN RESPONSE TO THIS REQUIREMENT, THE CITY HAS UNDERTAKEN A MULTIMILLION DOLLAR EFFORT TO DEVELOP CONTROL MEASURES FOR MORE THAN 500 OVERFLOW POINTS.

THE USEPA NEEDS SURVEY REPORT (SUBMITTED TO CONGRESS IN FEBRUARY 1989) SHOWS AN ESTIMATED COST OF CSO CONTROL FOR ALL NEW YORK STATE MUNICIPALITIES OF $5.7 BILLION. ALTHOUGH THIS REPRESENTS A SIGNIFICANT INVESTMENT OF PUBLIC FUNDS, IT IS NECESSARY IF WE ARE TO ATTAIN THE FISHABLE, SWIMMABLE GOAL FOR THE WATERS OF NEW YORK STATE UNDER THE CLEAN WATER ACT. THE COST OF CSO CONTROL MUST BE CONSIDERED IN ANY REVIEW OF THE AUTHORIZED FUNDING LEVEL FOR THE SRF PROGRAM IN TITLE VI.

EFFLUENT AND WATER QUALITY STANDARDS

ONE OF THE STRENGTHS OF THE CLEAN WATER ACT IS THAT IT ESTABLISHED A TWO-PRONGED APPROACH TO ATTAINING THE FISHABLE/SWIMMABLE GOAL OF THE ACT. THIS APPROACH RELIES UPON ESTABLISHING WATER QUALITY STANDARDS AND TECHNOLOGY-BASED TREATMENT REQUIREMENTS. THESE TWO IMPORTANT ASPECTS OF THE ACT MUST BE EMPHASIZED BECAUSE THE STANDARDS STILL IN USE BY EPA HAVE NOT KEPT PACE WITH TODAY'S TECHNOLOGY.

EPA'S WATER QUALITY CRITERIA DEVELOPMENT NEEDS TO BE ACCELERATED AND SHOULD FOCUS ON TOXIC SUBSTANCES AS IDENTIFIED IN THE PROCESS DEFINED IN SECTION 304(L) OF THE ACT AND IT SHOULD INCLUDE CRITERIA FOR CONCENTRATION OF TOXICS IN SEDIMENTS AND CRITERIA FOR BIOLOGICAL INDICATORS OF ACCEPTABLE AMBIENT CONDITIONS.

EPA MUST ALSO MOVE PROMPTLY TO DEVELOP BEST AVAILABLE TECHNOLOGY AND CATEGORICAL PRETREATMENT REQUIREMENTS FOR THE REMAINING SIGNIFICANT INDUSTRIAL EFFLUENT CATEGORIES, AS WELL AS UPDATE EXISTING REQUIREMENTS TO REFLECT CURRENT TECHNOLOGY.

THIS CONCLUDES MY FORMAL TESTIMONY. I WOULD BE PLEASED TO RESPOND TO ANY QUESTIONS THAT ANY MEMBERS OF THE SUBCOMMITTEE MAY WISH TO RAISE. I WOULD ALSO BE PLEASED TO PROVIDE ADDITIONAL INFORMATION ON ANY OF THE POINTS WHICH I HAVE DISCUSSED TODAY.

THANK YOU FOR YOUR ATTENTION AND CONSIDERATION.

ADDITIONS TO THE RECORD

REPRESENTATIVE BARBARA BOXER

TESTIMONY BEFORE THE SUBCOMMITTEE ON WATER RESOURCES

COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

March 21, 1990

Chairman Nowak and fellow members:

In the 1970s and 1980s we asked cities across the country to treat all wastewater to a secondary level. We appropriated billions of dollars to help the cities meet that requirement.

In the 1987 Water Quality Act, we have asked states and cities to meet even stricter water quality standards based on control of toxics. Yet we have not been willing to back up those requirements with the financial support needed to make it happen.

Congress has rightly established a national policy calling for protection of our nation's waters. They are a national resource. It is now incumbent upon us to follow this sound national policy with the provision of a reasonable level of financial support to allow it to be realized.

Therefore, I am here today to tell you that I support the reauthorization of the allocation formula in Title II of the 1987 Water Quality Act and I support the application of the allocation formula to the state capitalization grants authorized in Title VI of the Act.

Further, I support Congressman Rahall's legislation H.R. 3930. This bill reauthorizes the construction grant program at $2.4 billion per year until 1995. Without this federal support, we cannot realistically expect that the strict requirements and specific schedules resulting from the 1987 amendments will be successfully implemented.

Thank you for your time and consideration.

CI
FA

**COUNCIL OF
INFRASTRUCTURE
FINANCING
AUTHORITIES**

Chairman of the Board
M. Reginald Arnold II
Texas
Executive Director
George F. Ames

April 10, 1990

The Honorable Henry J. Nowak
Chairman, House Subcommittee on Water
Resources
B370A Rayburn House Office Building
Washington, D.C. 20515-6262

Dear Mr. Chairman:

I am writing to bring to your attention the results of a recent survey the Council of Infrastructure Financing Authorities conducted of State officials involved with implementation of the State Revolving Fund (SRF) programs under the Clean Water Act. The attached survey suggests certain amendments to the most controversial provisions of Title VI. Officials from 39 States responded, comprising 89 percent of the States that have received capitalization grants to date.

The amendments receiving the greatest approval were as follows:

- o Limitation of Federal oversight of the SRF programs to the Federal capitalization period (93%);
- o Allowing cash draws from the letter of credit at the time the State makes a binding commitment up to the amount of the commitment (91%);
- o Making land acquisition eligible for SRF assistance (89%); and
- o Allowing State discretion in determining the amount of SRF funds needed for State administrative expenses (87%).

In general, we believe these results sharply underscore the intention of Congress that the SRF programs be State administered.

The remaining recommended amendments received less consensus, reflecting in our opinion variation in State administrative policy. Most notably, 65 percent of the respondents favored elimination of all Title II requirements applicable now to the SRF programs, while 30 percent favored their retention but with greater discretion of the Governor as to their interpretation and application. An important point here, however, is that 95 percent favored change to the present provision.

Another area of critical concern deals with the types and conditions of financial assistance available to small communities. Sixty percent favored relaxing the present restrictions in Title VI by allowing longer loan payback periods and extended deferral of principal and interest payments. Many respondents suggested alternative definitions of small communities, and lastly there was considerable support for a separate grants programs for hardship situations.

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Washington, D.C. 20005
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(202) 639-4021

We respectfully request that these results and findings be taken into consideration by the respective committees responsible for reauthorization of the Clean Water Act. We would be happy to provide oral or written testimony as part of any future hearings.

I have also enclosed for your information a copy of CIFA's written statement provided the House Committee on Ways and Means on how the Federal tax system could be used to improve the environment. We feel strongly that certain tax policies have had a deleterious effect on the capability of State and localities to finance environmental infrastructure through the sale of tax-exempt bonds. Restrictions in the tax code affecting the issuance of tax-exempt bonds and the use of their proceeds have made it more expensive to borrow capital. That fact translates directly into more time to achieve less compliance with environmental and public health standards.

To counter this trend and focus on the critical public-purpose aspect of tax-exempt financing, Senators Domenici and Boren have introduced S.700—the Environmental Infrastructure Act. This bill would yield significant lasting benefits by lowering the costs of financing environmental infrastructure at a time when capital spending requirements for such facilities are rising dramatically.

If additional information on the survey or testimony would be helpful, please contact our Executive Director, George Ames at (202) 347-6333. Thank you for your attention to this letter.

Sincerely,

Jack R. Fickessen

Jack R. Fickessen
Chairman, CIFA

JRF/fl
Enclosures

March 27, 1990

SUMMARY OF FINAL RESULTS OF CIFA SURVEY OF STATE OFFICIALS ON CERTAIN RECOMMENDED AMENDMENTS TO TITLE VI OF THE CLEAN WATER ACT

The Council of Infrastructure Financing Authorities recently conducted a survey of State officials involved in the implementation of the State revolving fund programs to determine where general agreement might exist on the need for amendments to Title VI. The attached survey presents several amendments recommended by CIFA to the most controversial provisions of Title VI.

Final results of the survey are outlined below. Forty-six State officials responded from 39 States. By far the greatest majority of respondents favored four amendments: Limitation on the duration of federal oversight (93%); allowing cash draws at the time of a binding commitment (91%); making land eligible (89%); and allowing State discretion to use SRF funds for administrative costs (87%). A sharp break in consensus occurred with amendments concerning equivalency requirements and small communities. Of the three equivalency options presented, Option A, which called for elimination of all requirements received 65% approval. Options B and C which respectively allowed Governor's discretion and flexibility in interpretation received only 17 and 13% approval. The small community amendment met with only 60% approval and received the largest number of alternatives. This diversity of opinion strongly suggests that additional small community options need to be considered including establishing a separate loan and grant program for hardship situations.

I. Binding Commitments: Section 602(b)(3)

	Number	Percent
Favor	42	91
Oppose	2	4.5
No Opinion	2	4.5
Total	46	100.0

II. Equivalency Requirements: Section 602(b)(6)

	Number	Percent
Favor		
Option A	30	65
B	8	17
C	6	13
No Change	1	2.5
No Opinion	1	2.5
Total	46	100.0
Oppose		
Option A	2	4.5
B	6	13
C	8	17

Alternatives

- Delete certain Title II requirements, suggested as 201(9)(2), 201(g)(5) and (g)(6), 201(o), 204(b)(1), 204(d)(2), 218 and 513. (one respondent)
- Retain certain Title II requirements suggested as 201(g)(3), 201(o), 204(a)(1) and (2), 204(b)(1), 218 and 511. (one respondent)

III. Land Eligibility: Section 603(c)

	Number	Percent
Favor	41	89
Oppose	4	8.5
No Opinion	1	2.5
Total	46	100.0

Alternatives

- Allow SRFs to fund interest subsidies for the purchase of land.
- Limit eligibility to land directly required for construction and operation.
- Limit eligibility to costs of "taking" under eminent domain.

IV. Small Communities: Section 603(d)

	Number	Percent
Favor	28*	60
Oppose	18	40
No Opinion	--	--
Total	46	100.0

* Two respondents favored extending only the amortization period.

Alternatives

- Use other population sizes to define small communities: 2,500, 5,000 or 10,000.
- Use other amortization periods, 25 or 30 years, and link the amortization period to useful life.
- Begin the amortization period at State discretion.
- Allow 2.5 year deferment of payment of principal and interest.
- Allow State grants under the SRF for hardship situations, without federal requirements.
- Create a separate grants program for small communities.

V. State Administrative Costs: Section 603(d)(7)

	Number	Percent
Favor	40	87
Oppose	4	8.5
No Opinion	2	4.5
Total	46	100.0

Alternatives

- Increase 4% cap.
- Apply 4% to total fund.
- Establish $400,000 minimum.

VI. Oversight: Section 606

	Number	Percent
Favor	43	93
Oppose	2	4.5
No Opinion	1	2.5
Total	46	100.0

Alternatives

- Apply to only "EPA participation States."
- Examine for tax considerations that may require retention of some federal oversight.

By Order of Preference

	Number	Percent
Oversight	43	93
Binding Commitments	42	91
Land Eligibility	41	89
Administrative Costs	40	87
Equivalency/Option A	30	65
Small Communities	28	60
Equivalency/Option B	8	17
Equivalency/Option C	6	13

Recommended Amendments to Title VI of the Clean Water Act

I. **Binding Commitments. Section 602(b)(3) is amended by adding as a last sentence the following: "At the time the State enters into a binding commitment, the State may make cash draws up to the amount of such commitment."**

Effect: Allows the State to begin cash draws from the LOC in advance of initiation of construction.

Favor: ☐ **Oppose: ☐**

Alternative ____

____

____

____

II. Title II Grant Conditions and other Cross-cutting Requirements. Section 602(b)(6). (Three options are given):

Option A: Section 602 (b)(6) is deleted.

Effect: Eliminates all so-called equivalency requirements.

Option B: Section 602(b)(6) is amended by adding at the beginning the following: "The Governor of the State has made a determination whether . . ." And adding after "(as determined by the Governor of the State) under . . ." the following: "all or any provisions of . . ."

Effect: Eliminates mandatory requirements as in Option A, but recognizes explicitly the discretionary authority of the Governor to continue to apply some or all of them.

Option C: Section 602(b)(6) is amended by deleting at the end the following phrase "in the same manner as treatment works constructed with assistance under title II of the Act."

Effect: Allows State flexibility in interpreting compliance with this section.

Most Favor: Option(s) ____________ Oppose: Option(s) __________
(in order of preference)

Alternative ____

____

____

____

VI. **Oversight.** Section 606 is amended by adding a new subsection "(g) Duration of Federal Oversight" to read as follows: "The provisions of Section 606(c), (d) and (e) of this title will apply only during ~~the end of~~ the capitalization period defined as that time required to make all grant payments to the water pollution control revolving fund. Commencing the fiscal year following the end of the capitalization period, each State will carry out the provisions of subsection 606 (b) of this title."

Effect: Limits Federal oversight to a specifically defined period, and gives States the sole authority to conduct subsequent annual audits.

Favor: ☐ Oppose: ☐

Alternative ______________________________

____

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* * * * * * *

If you have any questions, please contact George Ames at (202) 347-6333. Thank you for completing this survey.

Name ______________________________

Agency ______________________________

Address ______________________________

____

Telephone (   ) ______________________________

Please send with any additional comments and suggestions to :

CIFA
300 Metropolitan Square
655 15th Street, N.W.
Washington, D. C. 20005

Our FAX is (202) 347-6109.

Written Statement
# of the
Council of Infrastructure Financing Authorities
on Means by which the Federal Tax System
Could be Used to Improve our Environment

March 23, 1990

The Council of Infrastructure Financing Authorities (CIFA) appreciates the opportunity to provide written comment on ways the Federal tax system could be used to improve the environment. I am Jack Fickessen, Chairman of CIFA, which is a national, nonprofit association of public agencies providing financial assistance to localities for the construction of public infrastructure.

Your invitation for testimony implies a conclusion that we heartily endorse: The Federal tax system can be used to significantly improve our environment. We believe the primary means by which this laudable goal is achieved is through encouraging investment in areas where environmental goals and standards are a matter of public policy.

Our written statement addresses specific and general measures designed to lower costs of investment in public-purpose environmental infrastructure. Such facilities are those required to meet Federal and State requirements pertaining to the protection of public drinking water supplies, compliance with technology and water quality based permit limits for wastewater dischargers, ensuring the safe disposal and reuse of solid waste, and compliance with air emission standards. Recent studies conducted by the Private Sector Advisory Board on Infrastructure Financing and National Council on Public Works Improvement have indicated a strong correlation between the level and trend of investment in infrastructure and national productivity. In terms of environmental infrastructure, this holds doubly true both from the standpoint of the direct services provided by the facilities themselves and from the overall improvement in the quality of our life by gains in environmental protection.

The U.S. Environmental Protection Agency has suggested that compliance with the Federal Clean Water Act will require more than $100 billion in new investments by the year 2000. An additional estimated $115 billion to $160 billion will be needed by that year to maintain and upgrade safe and dependable water supply systems. Compliance with Federal requirements for the disposal of hazardous and solid waste and the currently debated amendments of the Clean Air Act will cost billions of dollars more.

To meet these Federal mandated environmental requirements, states and local governments rely on basically four traditional means of financing - revenues, both general and dedicated, special assessments, short-term borrowing, and bonded indebtedness. More than 60 percent of the annual capital investment in these required facilities comes from the sale of tax-exempt bonds by state and local governments. The changes in the Federal Tax Code, beginning with the 1982 changes and continuing with the Tax Reform Act of 1986, and the legislative changes in 1987 and 1989, have not diminished the reliance of state and local government issuers on this critical means of raising capital. But costs of issuance, administrative costs and yields are generally higher than they otherwise would be as a direct result of restrictions placed on the sale of tax-exempt bonds and the use of their

> environmental infrastructure that are not described in Section 141, the exceptions to rebate described in clause (1)(iii), this clause, and subparagraph (c) of Section 148(f)(4) shall be available to the issuer of the pooled financing bonds to the extent they are available to the issuer of the underlying obligations.

BANK DEDUCTIBILITY: The 1986 Act sharply reduced the ability of commercial banks purchasing municipal tax exempt bonds to deduct the cost associated with the purchase and carrying of such bonds. The only exception provided to this limitation was provided to banks which purchased bonds sold by communities who sold $10,000,000 or less of such bonds in a calendar year.

The national market for these so-called bank eligible bonds is now paying a premium for them such that the interest rate on a bank eligible bond is 25 to 35 basis points lower than an identically rated bond that is not bank eligible. Communities which borrow through environmental bond bank pooled financing systems to obtain the money for their environmental projects are denied this bank eligibility even if they are borrowing less than $10,000,000. Accordingly, they are paying 1/4% or more higher interest rate charges on their bonds for twenty or thirty years and the Treasury suffers a revenue loss because the buyers of these bonds are not paying taxes on the additional income they obtain at the higher interest. By allowing the pass through of bank eligibility to environmental pooled issuers, the small issuers would obtain a lower interest rate for their environmental projects and the treasury would see a reduction in its revenue loss from the sale of these bonds.

SOLUTION: Amend subparagraph (f) of section 265(b)(3) by adding the following sentence:

> For purposes of this subparagraph (f), the term "composite issue" shall not include any qualified tax-exempt obligation merely by reason of its purchase by a pooled issuer with the proceeds of obligations described in Section 103(a) for environmental infrastructure that are not described in Section 141.

Additionally, we urge for the committee's consideration raising the small issuer exemption from $10 million to $25 million and, similarly, the arbitrage rebate exemption from $5 million to $25 million. These two improvements would significantly enhance the capability of small and moderately sized communities to construct affordable facilities.

General Comment

An interesting point has received recent attention in the debate over tax-exempt bonds for public-purpose infrastructure. From the standpoint of classical economic theory, tax-exempt bonds, and perhaps tax preferences in general, are apparently viewed as a less efficient means of providing Federal assistance than, say, a grant program. To argue, as some analysts have, that tax-exempt bonds are an inefficient subsidy misses the point. In a continuing era of declining direct Federal aid and increasing needs, including those stemming from unfunded Federal environmental mandates, there simply are not many options left to States and localities. The prospects for more "efficient" subsidies are virtually nonexistent. Tax-exempt financing will continue as the major source of capital for environmental infrastructure, far surpassing "pay-as-you-go" and taxable bonds as practical alternatives.

Therefore it is our general position that one of the greatest opportunities in using the Federal tax system for environmental improvement lies with lowering the costs of tax-exempt bonds for legitimate public-purpose environmental infrastructure necessary

National
Association of
Regional
Councils

1700 K Street NW • Suite 1300 • Washington DC 20006
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TESTIMONY OF

THE NATIONAL ASSOCIATION OF REGIONAL COUNCILS

FOR THE

SUBCOMMITTEE ON WATER RESOURCES

OF THE

PUBLIC WORKS AND TRANSPORTATION COMMITTEE

UNITED STATES HOUSE OF REPRESENTATIVES

April 4, 1990
Washington, D.C.

President
GUS F. MUTSCHER
Brenham, Texas

First Vice President
JOHN A. F. MELTON
Los Angeles, California

Second Vice President
BRIAN CORCORAN
Seattle, Washington

Immediate Past President
T. J. "TED" HACKWORTH
Denver, Colorado

Executive Director
RICHARD C. HARTMAN

The National Association of Regional Councils represents a majority of the Nation's 530 substate regionals associations of government. Regional councils of government, which in some areas are called regional planning commissions, local development districts or associations of government, are agencies of local government under the direction of city and county elected officials. They fill a gap in our intergovernmental structure by dealing with problems, such as water quality, that transcend jurisdictional boundaries and must be addressed on a regional basis.

The basic responsibility of a regional council is to be an umbrella agency that facilitates regional coordination and management activities. Many regional councils also arrange for the implementation of regional policies and programs. Regional councils also allow rural local governments to more efficiently coordinate and deliver programs vital to rural areas.

In addition, many of the 530 regional councils are designated areawide water quality management planning agencies. These councils provide an important linkage between local governments and the states by performing planning, coordination, and public information activities leading to implementation of programs and policies to control the sources of water pollution and attain national water quality standards. It is this linkage that assures the direct involvement of local governments which are ultimately responsible for implementation of policies and regulations to control the sources of water pollution.

In 1981 Congress strengthened its commitment to areawide water quality management planning when it mandated in Section 205(j) a one percent set aside from wastewater construction grants for water quality management planning. Congress explicitly directed the states to give funding priority to designated public comprehensive planning organizations. In 1987, amendments to the Clean Water Act, Congress reaffirmed its commitment to areawide water quality management planning with a requirement that the states pass through at least forty percent of water quality management planning funds to areawide agencies.

Moreover, Congress wisely ensured that as the national program transitioned from a grants assistance program for wastewater treatment facility construction to a revolving loan program, the states would continue to comply with planning and regulatory requirements in the Federal Water Pollution Control Act as a prerequisite for the use of such funds. This is a condition precedent to the continued eligibility by states for revolving loan capitalization grants from EPA. We strongly endorse that policy; it will not only provide vitally needed planning funds, but most importantly, it will provide the opportunity for local governments to contribute to the attainment of water quality objectives.

We know that regional councils can make a substantial contribution to attaining the national objectives in the Clean Water Act. Moreover, third efforts have tangible results; it is not planning for planning's sake. At the end of this presentation, we have set forth representative sample of the type of these water quality management planning activities.

Our current concern is over the continuation of the 205(j) program. We believe that the Water Quality Act of 1987 clearly requires each state that receives a capitalization grant set aside a part of such grant for 205 planning purposes. Apparently, this view is not shared with many state agencies that administer the revolving loan program. Some of our members understand that their state believe that the 205(j) planning program and its set aside requirement will no longer apply when the construction grant program is fully converted to capitalization grants in FY91. And this interpretation is a cause for alarm by our regional councils.

NARC believes this matter can be easily reconciled. We understand that the committee proposes legislation to amend the Act to establish new apportionment factors for the delivery of capitalization grant funds to the states. At that time, we urge you to clearly restate that Section 205(j) planning, including the 40% pass through provision, shall be maintained out of set asides from the annual federal capitalization grants for state revolving funds.

To evidence the contribution such planning funds can have on attaining national water quality objectives, we have listed some examples of the activities undertaken with 205(j) funding. Further, such activities are being undertaken with minimal federal investment, and have a large pay-off in terms of contributing to meeting the goals of the Federal Water Pollution Control Act. In many instances, regional councils have leveraged these funds to obtain substantial local and state funding beyond what is required to match the federal funds.

The Metropolitan Washington Council of Governments (MWCOG), Washington, D.C., was an early participant in water quality management planning funded under section 205(j) of the Water Quality Act. The planning and research activities funded under "205(j)" have provided the technical foundation for MWCOG's current water quality program which is now focused on implementation of water quality controls and ongoing monitoring to identify water quality trends and evaluate performance. While MWCOG's current program is supported for the most part with local funds, the current level of technical sophistication would not have been possible without the initial federal support under the 205(j) water quality management planning program.

An example of MWCOG's current activities is a project to restore the highly urbanized Anacostia watershed. This project builds upon MWCOG's successful program for controlling urban runoff. In 1988 state and local agencies signed a formal interjurisdictional agreement to comprehensively address the problems of the Anacostia watershed and to restore it to a clean, healthy, regional resource. MWCOG is providing the administrative and technical support for this effort. Under the agreement, the signatories will (1) earmark funds for the development and implementation of initiatives stated in restoration workplans; (2) implement local and regional programs and projects; and (3) annually evaluate and report the progress of the restoration effort.

During the first year much work was accomplished toward restoration of the watershed including an intensive baseline analysis of water quality conditions to provide a snapshot of the problems; the development of a mathematical model of the tidal Anacostia; the design, construction and implementation of a number of water quality control projects, most notably the construction of the infrastructure for a program to minimize combined sewer overflow; inventories to identify potential retrofit projects within the watershed; and an increase in the number and efficiency of sediment and urban runoff controls in the basin.

The Northern Virginia Planning District Commission (NVPDC), Annandale, Virginia, routinely performs technical reviews of urban Best Management Practice (BMP) plans during the design phase of development. In 1987, NVPDC conducted for jurisdictions within the Occoquon River Basin an analysis of regional BMPs looking at cost-effectiveness and developing siting and design criteria. This information provided local jurisdictions with the planning tools necessary to implement regional BMPs. Using local-only funding, NVPDC has also prepared a BMP handbook for the Occuoquon Watershed. The handbook contains detailed information on each type of BMP including step-by-step design procedures, factors to consider when designing a BMP facility, examples of existing facilities in the area, and detailed design aids. In addition, to improve practical design guidelines for use by engineers designing BMPs, NVPDC recently conducted a laboratory investigation of three areas associated with BMP performance to be able to better quantify expected pollutant removal rates.

The Northeast Ohio Areawide Coordinating Agency (NOACCA), Cleveland, Ohio, recently initiated a project to provide for increased implementation of nonpoint source pollution controls on land draining into a major lake within the region. The project involves the inventorying of ground conditions to enable the design and implementation of remedial measures, and the demonstration of an efficient and cost-effective process by which control needs can be quantified. NOACA recently undertook three projects to assist local communities in defining their groundwater management needs and to develop recommended programs to meet those needs. The projects included the development of a unified environmental data base management system, technical assistance in the development of a local groundwater management plan, and the development of a plan for enhanced public participation in local groundwater management programs. NOACA plans to launch similar efforts in watersheds throughout the five-county planning area.

In 1988, the Houston-Galveston Area Council (HGAC), Houston, Texas used 205(j) funding to support its participation with the Texas Water Commission in the preparation of the State Nonpoint Source Assessment and Management Reports. Under this project, HGAC identified and evaluated watersheds with potential nonpoint source-related water quality problems; identified activities and land uses that would generate nonpoint source pollution; identified specific pollutants known or suspected to contribute to water quality problems; and identified BMPs to control nonpoint source pollution and which were in place throughout the region. HGAC also developed recommendations for the control of nonpoint source pollution throughout the region, and recommended a framework for establishing watershed task forces to address nonpoint source pollution. Over the next year, HGAC will hold workshops on BMPs to develop model guidelines for use in any of its watersheds.

Federal 205(j) funding also supports HGAC's ongoing work in wasteload projections which is used by the state in water quality monitoring as well as by HGAC in their involvement in the Galveston Bay National Estuary Program and the Wellhead Protection Program.

The Southeastern Michigan Council of Governments (SEMCOG), Detroit, Michigan, using 205(j) funds prepared a remedial action plan for the Rouge River, one of the most polluted in the country. In preparing the plan, SEMCOG used advisory committees made up of the local units of government and other decisionmakers with a stake in the clean-up of the river. Because of the involvement of the local communities in the planning process, SEMCOG was able to gain the endorsement of the communities in the river basin and the endorsement of the Michigan Department of Natural Resources on a very highly controversial and expensive plan, The plan is now being utilized as the basis for NPDES permits aimed at implementing clean-up activities.

The Piedmont Triad Council of Governments (PTCOG), Greensboro, North Carolina, with the support of federal 205(j) funding has been actively involved in nonpoint source pollution control. During the past year, three activities are of particular note:

- PTCOG conducted indepth field surveys of all point and nonpoint sources in the watershed area encompassed by the council. Detailed inventories and maps were prepared for use by the council and local jurisdictions.

- PTCOG was able to secure the support of all local governments located in the watershed to enact watershed protection ordinances.

- PTCOG developed a model watershed protection ordinance for use by the local jurisdictions with urban and rural BMP guidelines for control of runoff, sedimentation, contamination and stormwater.

These are but a few examples of ways in which regional council water quality management planning programs and activities can make a valuable contribution toward preserving and enhancing the quality of our nation's water resources. We believe these kinds of activities need to be fostered and the role of regional councils preserved.

Some states are, in fact, fulfilling the statutory requirement for updating and maintaining 208 areawide water quality management plans plans and are complying with the mandatory pass through to regional councils of water quality management planning funds. In these cases, the states are taking full advantage of the potential contributions, such as those illustrated above, that regional councils can make. Nevertheless, we know that in most cases states are ignoring these requirements. Unfortunately, the Environmental Protection is not adequately monitoring state compliance with these planning and pass through requirements. Therefore, we have no way of knowing whether the states are diverting 205(j) planning funds without a finding, in consultation with local governments, that there are no activities that regional councils can undertake that would contribute to meeting the goals of the Act.

We strongly urge this Committee, in its oversight function, require the Environmental Protection Agency to fulfills it responsibility enforcing state compliance with requirements of the Act that call for a mandatory pass through of water quality management planning funds and for consistency with 208 areawide water quality management plans. This is of particular concern because we are at a vital juncture: states soon will be fully administering the EPA-supported Revolving Loan Program which also carries with it the requirements for consistency with 208 areawide water quality management plans and pass through of planning funds.

Natural Resources
Defense Council

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202 783-7800
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Honorable Henry J. Nowak, Chairman
Subcommittee on Water Resources
Committee on Public Works and Transportation
B-370A Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

As you know, the Natural Resources Defense Council (NRDC) has a longstanding interest in achieving the goals of the Clean Water Act (CWA). We were major participants in the enactment of the 1972 Act, as well as the significant amendments in 1977 and 1987. And over the years we have worked with you and your Subcommittee staff to seek diligent oversight and full implementation of the CWA and to support strengthening amendments.

We learned for the first time on March 19th that your Subcommittee planned to hold hearings on March 21st and 22nd to receive testimony on the reauthorization of the CWA. Unfortunately, this short notice did not enable us to prepare detailed testimony in time to offer during the course of this hearing. Because the CWA is so important, we did not by our silence wish to suggest that NRDC considers all to be well. We hereby request that this letter be made a part of the hearing record in lieu of formal testimony.

We recognize that the authorizations for a number of CWA programs (such as sec. 319 and sec. 106) are expiring and need to be extended. Reauthorization of these programs can be undertaken in one of two ways: either as a relatively narrow exercise (with hearings focused on the extension of expiring programs) or as a broad-ranging inquiry into the successes and failures of the CWA as a whole, with an eye to reopening the CWA to fix programs that are not working or to add new programs.

Before the Clean Water Act is reopened for full-scale reconsideration (as opposed to a simple extension of existing program authorizations or minor technical amendments), Congressional oversight of the 1987 amendments is badly needed. For example, it would be extremely informative for the Subcommittee to hold hearings to assess EPA's implementation of the nonpoint source pollution control program under sec. 319; the revision of effluent guidelines under sec. 304(m); the adoption of sludge technical criteria under sec. 405; the implementation of water quality-based controls for toxics under sec. 304(l), and the development of stormwater regulations under sec. 402(p) of the CWA.

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However, we hope that the Subcommittee does not view these hearings as the end of its CWA inquiry, and that you will undertake a series of hearings aimed at analyzing the EPA's implementation of the 1987 amendments before you close the book on the Clean Water Act. We look forward to working with you throughout the oversight process.

Sincerely,

Robert W. Adler
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Clean Water Project
Director

Jessica C Landman
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SCORECARD ON CLEAN WATER

PERFORMANCE OF THE
U.S. ENVIRONMENTAL PROTECTION AGENCY
IN COMPLYING WITH
THE 1987 WATER QUALITY ACT

NATURAL RESOURCES DEFENSE COUNCIL, INC.

MAY 1, 1989

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NRDC'S SCORECARD ON EPA'S COMPLIANCE WITH THE 1987 WATER QUALITY ACT

REQUIREMENT	HAS EPA MET ITS DEADLINE?	HAS EPA DONE WHAT CONGRESS ASKED?
Sludge Rules	NO	NO
Second Round Rules for New Industries	NO	NO
Toxic Hotspots	Partially	NO
Toxic Water Quality Criteria	Mostly	NO
Stormwater Rules	NO	NO
Organic Chemicals Rules	NO	Mostly
Pesticides Rules	NO	No Action
Nonpoint Source Pollution Plans	Mostly	NO

EXPLANATION OF NRDC'S SCORECARD ON EPA'S COMPLIANCE WITH THE 1987 WATER QUALITY ACT

INTRODUCTION

In February, 1987, Congress reauthorized the federal Clean Water Act through enactment of the Water Quality Act of 1987 (P.L. 100-4). This statute recognized that, despite progress made under the 1972 and 1977 versions of the Clean Water Act, many of the Nation's rivers, lakes and coastal waters remained badly polluted. To cure these problems, Congress established a major new agenda for the U.S. Environmental Protection Agency's water quality program.

August, 1989 will mark the midpoint of the five-year Clean Water Act reauthorization cycle. While this midpoint is only three months away, EPA is far from half-way through the agenda set by Congress in 1987. In fact, EPA is remarkably far behind. Worse, many of the actions that EPA has taken simply do not do what Congress asked.

The Natural Resources Defense Council, Inc. (NRDC), a national environmental organization with over 100,000 members, evaluated EPA's compliance with what NRDC believes are eight of the most important requirements of the 1987 law. The scorecard shows that EPA has violated or continues to violate Congress' deadlines with respect to five of the eight programs, and has met Congress' deadlines only partially for the remaining three. Further, the scorecard shows that EPA is thwarting Congress' intent on five of the eight programs, and is complying with the law only partially for another two. (No action has been taken with respect to the eighth program.)

The Scorecard and an explanation of the scores follow.

Basis for Issue Selection

The 1987 Water Quality Act includes scores of specific requirements. Some of these requirements are critical to the health of the Nation's surface waters. NRDC selected for its scorecard the major action-forcing tasks required by the 1987 law -- tasks that most directly will result in water quality gains. NRDC specifically excluded from its scorecard such tasks as studies, reports, guidance documents, funding programs and site-specific or regional work.[1]

Issue 1 - Sludge Rules

What Congress Required

EPA is required to set numeric criteria defining safe levels of toxic pollutants in sewage sludge, for sludge use and disposal methods such as landfilling, incineration, and reuse as fertilizer or soil conditioner. (CWA Section 405(d)).[2]

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[1] This does not reflect on the importance of these other programs. NRDC elected to evaluate EPA's overall compliance with the 1987 Water Quality Act by focusing on the most important nationwide programs established or modified by the law.

[2] Citations to the Clean Water Act are identified as "CWA". Citations to uncodified sections of the 1987 Water Quality Act are identified as "WQA".

A first round of sludge regulations was due on August, 31, 1987, based on information available to EPA when the 1987 Water Quality Act was passed. A second round of sludge regulations was due on June 15, 1988, based on new information to be collected by EPA.

EPA's Performance

No final sludge rules have been promulgated by EPA. The first round of rules was not proposed until February 6, 1989. EPA did not begin to collect new information until early in 1989.

The proposed sludge rules set specific numeric criteria for toxics in all sludge uses or disposal methods except disposal in municipal landfills, which accounts for about 40 percent of all sludge generated. This will not protect public health from toxics in sludge that is landfilled, and actually will encourage the disposal of sludge in landfills rather than the reuse of clean sludge for fertilizer or soil conditioner. This result is the opposite of what Congress intended.

Issue 2 - Second Round of Industry Rules

What Congress Required

EPA is supposed to identify and fill in the major loopholes in its existing industrial water pollution control regulations. (CWA Section 304(m)). Many industries are not covered by EPA's rules, and rules for industries that are covered are incomplete. As a result, hundreds of millions of pounds of toxic and other dangerous pollutants are discharged each year into the Nation's surface waters.

A final list identifying the gaps in EPA's industrial pollution control regulations was due on February 4, 1988. Final rules to fill in these gaps are due on February 4, 1991.

EPA's Performance

EPA issued a draft list of possible new industries to regulate on August 25, 1988. EPA does not expect to issue a final list until September, 1989, a year and a half late.

The draft list falls far short of identifying all gaps in EPA's existing regulations. In fact, the only rules scheduled for issuance under the draft list are those that are required by an existing court order or specific statutory provision. Only 6 industries will be regulated under this proposal; and major polluting industries will be excluded.

Issue 3 - Toxic Hotspots

What Congress Required

Following guidance and schedules set by EPA, state water quality agencies were directed to identify "toxic hotspots," waters polluted by dangerous toxic pollutants. States are supposed to develop detailed control strategies to clean up these toxic hotspots. (CWA Section 304(l)).

Final lists of hotspots were due on February 4, 1989. EPA has until June 4, 1989 to approve or disapprove the state lists and control programs.

EPA's Performance

Most states have submitted their lists of toxic hotspots to EPA for review and approval, although many lists were late, and some lists still have not been finalized. Yet EPA still has not issued a final rule to implement this program.

However, based on EPA guidance that included an illegal interpretation of the Water Quality Act, states are developing control strategies to clean up hotspots only if they are polluted entirely or substantially by factories and sewage treatment plants. No control strategies are being prepared to clean up toxic hotspots where a significant amount of the pollution is due to poison runoff from farms, city streets and other lands uses. California, for example, developed control plans for only 4 - 5 percent of the toxic hotspots identified by the state.

Issue 4 - Water Quality Criteria for Toxics

What Congress Required

Following guidance from EPA, states must revise their water quality standards to include specific numeric water quality criteria for toxics that may be present in state waters. (CWA Section 303(c)(2)(B)).

Revisions are due when each state conducts its normal triennial review of water quality standards under CWA section 303.

EPA's Performance

Many states are issuing water quality criteria for toxic pollutants during their triennial reviews. However, because of EPA guidance based on an illegal interpretation of the Water Quality Act, a few states are promulgating only procedures to address toxic pollutants, rather than specific numeric criteria as Congress directed.

Issue 5 - Stormwater Regulations

What Congress Required

To cure EPA's decade-long inaction in regulating polluted runoff from factories and urban areas ("stormwater"), Congress set a firm deadline for EPA to phase in strict new stormwater control requirements. (CWA Section 402(p)).

Regulations covering industrial runoff and runoff from municipalities with 250,000 or more people were due on February 4, 1989. Regulations covering smaller municipalities are due on February 4, 1991.

EPA's Performance

EPA did not issue proposed rules for the first round of stormwater regulations (industries; municipalities greater than 250,000) until December 7, 1988. Final rules are expected to be at least a year late.

EPA's proposed rule severely narrows and weakens Congress' intended controls. For example:

* EPA proposes to require controls only by "incorporated" municipalities, despite the far broader definition of

"municipality" in the Clean Water Act. As a result, for example, stormwater controls will be required in the District of Columbia but not in Montgomery County, Maryland or Arlington County, Virginia.

- EPA's proposal includes virtually no actual control requirements, amounting instead to a "write your own permit" program for municipalities.
- EPA illegally proposes to exempt polluted runoff from factories that enters municipal storm sewers, whether or not these sewers are subject to municipal stormwater controls.

Issue 6 - Organic Chemicals Rules

What Congress Required

EPA was required to issue water pollution rules for manufacturers of organic chemicals, plastics and synthetic fibers. The rules were supposed to cover all toxic pollutants released by these facilities. (WQA Section 301(f)).

The final rule was due on December 31, 1986.

EPA's Performance

The final rule was issued on November 5, 1987, almost a year late.

In response to a lawsuit brought by NRDC, the United States Court of Appeals in New Orleans remanded the portion of the rule applicable to new chemical plants, noting that EPA failed to evaluate whether pollution from new plants could be eliminated altogether through such methods as wastewater recycling.

The final rule also failed to regulate a number of toxic pollutants released by chemical plants. The Court declined to rule on this issue, indicating that any challenge to the scope of the EPA rule should be brought in federal district court.

Issue 7 - Pesticides Rule

What Congress Required

EPA was required to issue water pollution rules for manufacturers of pesticides. The rules were supposed to cover all toxic and other dangerous pollutants released by these facilities. (WQA Section 301(f)).

The final rule was due on December 31, 1986.

EPA's Performance

EPA issued a final rule for pesticides manufacturers in 1985. However, in July, 1986, on learning of major problems with the data base compiled for the rule by agency contractors, EPA accepted a voluntary remand of the rule.

EPA has not yet proposed a replacement rule. The initial information questionnaire -- the first step in developing the rule -- was not issued until December, 1988, almost two years after the first rule was remanded! EPA does not expect to issue a final rule until at least 1991, about five years late.

Issue 8 - Nonpoint Source Control Plans

What Congress Required

Following EPA guidance, states were supposed to submit to EPA comprehensive programs to control poison runoff: polluted runoff from farms, urban areas and other land uses. Poison runoff causes at least half of the Nation's surface water pollution. Plans were supposed to reflect major new approaches to controlling poison runoff.

State plans were due on August 4, 1988; EPA approval or disapproval was due on February 4, 1989.

EPA's Performance

In part because of delays in EPA guidance on how to prepare poison runoff control programs, many state plans were late, incomplete, or both. EPA's guidance included virtually no new ideas on how to control poison runoff. As a result, most of the state plans simply catalog preexisting nonpoint source control programs -- a "business as usual" approach that will do little to reverse the problem of poison runoff. The approach that EPA should have taken will be explained in NRDC's forthcoming book -- Poison Runoff: A Guide to State and Local Control of nonpoint Source Pollution.

CONCLUSION - CONGRESSIONAL OVERSIGHT IS NEEDED

EPA's performance in implementing the key requirements of the 1987 Water Quality Act has been extremely poor. EPA has missed, or is likely to miss, virtually all of the major deadlines included in the 1987 law. Worse, many of the actions EPA has taken violate the letter or spirit of the 1987 Act.

In order to get EPA back on track, Congressional Committees with responsibility to oversee EPA's compliance with the Clean Water Act should conduct detailed oversight hearings this summer. Hearings could be scheduled to coincide with the midpoint of the Clean Water Act reauthorization schedule (August, 1989).

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